

Food Technology Abstracts

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Central Food Technological
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Food Technology Abstracts

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CFTRI, Mysore - 570 013, India.*

GENERAL

- 2552 HERTWECK (G). New concepts in feeding army and air force troops in combat. *Activities Rep.* 33(1); 1981; 19-22
- 2553 RICHARDSON (RP). A new concept for feeding air force ground launched cruise missile personnel. *Activities Rep.* 33(1); 1981; 27-31
- 2554 BYRNE (RJ). Contributions of new food service systems. *Activities Rep.* 33(1); 1981; 18
- 2555 BYER (M). Future of compressed foods from industry's viewpoint. *Activities Rep.* 33(1); 1981; 42-4
- 2556 CARON (PL). Field testings of compressed foods in the prototype emergency/assault packet. *Activities Rep.* 33(1); 1981; 35-41
- 2557 RAHMAN (A). Development of compressed foods for military food service systems. *Activities Rep.* 33(1); 1981; 32-4
- 2558 GRUNDKE (G). The significance of standards for improving food quality. Part 2. *Ernährungsforschung.* 24(4); 1979; 18-20 (German)
- 2559 PORTER (WL). Aids and handicaps to the prediction of military ration shelf life. *Activities Rep.* 33(1); 1981; 87-108
- 2560 KOPETZ (AA). Prospects for improving state of the art of predicting shelf life. *Activities Rep.* 33(1); 1981; 117-21
- 2561 STUMPF (SE). Food Safety: The social and economic perspective. *Activities Rep.* 33(1); 1981; 122-7
- 2562 HALL (RL). Food Safety: The industry perspective. *Activities Rep.* 33(1); 1981; 128-30

FOOD PROCESSING AND PACKAGING

PROCESSING

- 2563 KRACH (H) and KLABUNDE (H). Energy requirement in grain processing. *Getreide-Mehl. Brot.* 34(2); 1980; 29-34
- 2564 NIERLE (W), ELBAYA (AW), SEILER (K), FREIZDORFF (B) and WOLFF (J). Changes of grain components during extrusion with a twin-screw extruder. *Getreide-Mehl Brot.* 34(3); 1980; 73-6 (German)

In the hot extrusion, the water content of the extrusion material has greater influence on the changes of grain components than the temperature. Considerable differences exist between wheat and maize, which are shown especially in the swelling behaviour of the extrusion products and in the ability of starch to be decomposed by amylases. In the extruded wheat, no monosaccharides are found; in maize, on the contrary, the glucose or fructose content increases after the extrusion, whereas, saccharose and maltose are lost during

extrusion. The proteins aggregate due to the hydrothermic treatment and their solubility is limited. At the same time, the quantity of free aminoacids decrease considerably. Amylases and proteases are destroyed fully, and the peroxidases to the extent of 99%. The polar lipids and the free fatty acids are bound more closely during extrusion than the nonpolar lipids. KMD

- 2565 OLKKU (J), HASSINEN (H), ANTILA (J) and POHJANPALO (H). On process dynamics of automation of HTST extrusion cooking. *Getreide-Mehl. Brot.* 34(2); 1980; 46-52 (German)

High temperature short time (HTST) extrusion process was automated. The stability and general working of the automatic control device was satisfactory. Stepwise changes in the experiments were effected for determining the change in variables during the process. The various process parameters such as the quantity of raw material feed, rate of rotation of the screw, moisture content, temperature of cylinder, mass pressure and temperature were tested with regard to their effect. Wheat flour was used as raw material in these tests. KMD

- 2566 LINKO (P), OLKKU (J), ANTILA (J) and ROSENBERG (K). Retention of enzyme activity in HTST extrusion cooking. *Getreide-Mehl Brot.* 34(3); 1980; 76-81 (German)

It is known that enzyme activities are greatly reduced in HTST-extruded products. But this enzyme inactivation can be decreased by increasing the nozzle diameter of the extruder and the moisture content of the product, and by also increasing the quantity of raw material to be fed. In general, it can be said that the least cooked samples, with the least denatured starches show the highest residual diastatic activity in the extrudate. The residual activity of such enzymes of α -amylase and lipase can be of interest in a number of food uses and special analytical examinations of extruded products. KMD

PACKAGING

- 2567 MIYARES (B). Food package predictions for the 80's. *Activities Rep.* 33(1); 1981; 69-71

- 2568 KELSEY (RJ). Packaging technology: Tighter economics in the 80's. *Activities Rep.* 33(1); 1981; 72-5

- 2569 DAY (FT). Packaging in satchels, bags and paper containers: Advantages, materials, multipackaging. Part No. 1. *Confect. Prod.* 46(7); 1980; 326-7

- 2570 DAY (FT). Packaging in satchels, bags, pouches with notes on bundling and multipackaging. Part No.2. *Confect. Prod.* 46(8); 1980; 357-8

- 2571 LAMPI (RA). Retort pouch: The development of a basic packaging concept in today's high technology era. *J. Food Process. Eng.* 4(1); 1981; 1-18

Diagramatic description of retort pouch, the motivation behind developing the retort pouch, technical considerations, unit-operations, defects, seal area cleanliness, current status with regard to technology, commercialization, economics and the future research and development needs are the aspects covered. KAR

- 2572 HEINZ (DA). New marketing developments in flexible packaging for shelf stable foods. *Activities Rep.* 33(1); 1981; 76-84

- 2573 HOTCHNER (SJ). Packaging as a determinant in food shelf life. *Activities Rep.* 33(1); 1981; 109-16

FOOD ENGINEERING AND EQUIPMENT

- 2574 FARR (W) and BOLHOFNER (K). Chemical treatment of barometric condenser cooling water systems. *J. Am. Oil Chem. Soc.* 57(1); 1980; 6-7
The application of cationic polymers to barometric condenser cooling water systems is described. Reduction of fats, oils and greases from 900 ppm to 10 ppm in cooling water can be attained economically. AA
- 2575 WITTMER (V). High temperature engineering. *Chemie-Ingenieur-Technik.* 51(11); 1979; 1045-6
- 2576 TASSINARI (T), MACY (C), SPANO (L) and RYU (DDY). Energy requirements and process design considerations in compression-milling pretreatment of cellulosic wastes for enzymatic hydrolysis. *Biotechnol. Bioeng.* 22(8); 1980; 1689-705
- 2577 MAIORELLA (B) and WILKE (CR). Energy requirements for the vacuform process. *Biotechnol. Bioeng.* 22(8); 1980; 1749-51
- 2578 PRIFTI (JK). Current military food service equipment developments. *Activities Rep.* 33(1); 1981; 49-54
- 2579 GILKEY (F). Implementation of federal goals by food equipment manufacturers. *Activities Rep.* 33(1); 1981; 55-8
- 2580 GORENFLO (D). Cryogenic equipment. *Chemie-Ingenieur-Technik.* 51(11); 1979; 1036-42 (German)
- 2581 LEUSCHNER (G). Pumps, compressors, fittings. *Chemie-Ingenieur-Technik.* 51(11); 1979; 1021-6 (German)
- 2582 HIMMEN (E-U) and CAMPHAUSEN (J). Dust separators. *Chemie-Ingenieur-Technik.* 51(11); 1979; 1053-8 (German)
- 2583 KUHL (W). Vacuum equipment. *Chemie-Ingenieur-Technik.* 51(11); 1979; 1042-5 (German)
- 2584 TRAWINSKI (H). Centrifuges and hydrocyclones. *Chemie-Ingenieur-Technik.* 51(12); 1979; 1158-64 (German)
- 2585 SOMMER (K). Equipment for agglomeration, tabletting and coating. *Chemie-Ingenieur-Technik.* 51(11); 1979; 996-8 (German)
- 2586 BENDER (W), REDEKER (D) and STEINER (KH). Filter equipment. *Chemie-Ingenieur-Technik.* 51(12); 1979; 1177-83 (German)
- 2587 REINEKE (HH). Heat exchangers. *Chemie-Ingenieur-Technik.* 51(11); 1979; 993-6 (German)
- 2588 VOSTEEN (B), BRAUN (B) and STEIMEL (J). Dryers. *Chemie-Ingenieur-Technik.* 51(11); 1979; 1006-14 (German)

- 2589 MATZ (G). Crystallization equipment. *Chemie-Ingenieur-Technik*. 51(11); 1979; 1014-6 (German)
- 2590 ZAGRADZKI (SM) Jr. Mathematical method of a four-effect evaporator with turbocompressor. *Acta Aliment. Pol.* 5(3); 1979; 275-86
- 2591 GIERSIEPEN (G). Classifiers and sieving devices. *Chemie-Ingenieur-Technik*. 51(11); 1979; 1031-6 (German)
- 2592 EHRLICH (D) and KOLLMANN (K). Regulators and process control equipment. *Chemie-Ingenieur-Technik*. 51(12); 1979; 1197-203 (German)
- 2593 BURNS (DT), McKNIGHT (HB), QUIGG (RK) and SWINDALL (WJ). Automated signal recording system for the Perkin-Elmer 240 elemental analyser. *Analyst*. 105 (1251); 1980; 544-50
 An automated signal recording system for the Perkin-Elmer 240 elemental analyser is described. The system consists of two main areas - an electronic interface and a microswitch and cam assembly. This analyser can be used for the determination of carbon, hydrogen and nitrogen using a signal recording system. Construction of the accessories involved two main areas, ancillary electronic construction and the digital voltmeter and the printer and control signals. The main advantages of the device is the need for reduced operator attention and strain involved. BSN
- 2594 ZOCHBAUER (M). Plant measuring equipment. *Chemie-Ingenieur-Technik*. 51(12); 1979; 1190-4
- 2595 SCHINDLER (U). Particle measuring techniques. *Chemie-Ingenieur-Technik*. 51(11); 1979; 1065-8 (German)
- 2596 SCHMIDT (R) and BERGER (R). Equipment for distillation, rectification, sorption, permeation and extraction. *Chemie-Ingenieur-Technik*. 51(12); 1979; 1151-8 (German)
- 2597 WOLF (K-H). Substitution of calculation of a non-ideal flow reactor with a highly dispersed material system by calculation of an ideal mixer cascade. *Lebensmittel-Industrie*. 27(4); 1980; 162-4 (German)
- 2598 NOLTNER (G). Kneaders, mixers, stirrers and dosing equipment. *Chemie-Ingenieur-Technik*. 51(12); 1979; 1204-13 (German)
- 2599 SCHWINDT (R). Weighing systems and transport equipment. *Chemie-Ingenieur-Technik*. 51(12); 1979; 1167-77 (German)

FOOD CHEMISTRY AND ANALYSIS

- 2600 TWEETEN (TN) and EUSTON (CB). Application of high performance liquid chromatography in the food industry. *Food Technol.* 34(12); 1980; 29-37
 The components of food discussed include carbohydrates, amino acids and proteins, lipids, vitamins, preservatives and antioxidants, colours and flavours, antibiotics, food contaminants and pesticides. 97 references. KAR

- 2601 SZEBIOTKO (K), OLEJNIK (D), GRZESKOWIAK (Z), GRZESKOWIAK (B) and RATKOWSKI (W). The effect of the protein-fat preparations and autoxidation in their enzymatic digestibility and solubility. *Acta Aliment. Pol.* 5(3); 1979; 251-62
- 2602 PRAHL (L), SCHWENKE (KD) and BRAUDO (EE). Studies on the mechanical properties of gels of chemically modified proteins. *Acta Aliment. Pol.* 5(2); 1979; 183-9
- 2603 EVANS (WH), DELLER (D), LUCAS (BE), JACKSON (FJ) and READ (JI). Observations on the determination of total copper, iron, manganese and zinc in food stuffs by flame atomic-absorption spectrophotometry. *Analyst.* 105(1251); 1980; 529-43
- A method of determining total copper, iron, manganese and zinc is described which involves destruction of organic matter by wet oxidation and measurement directly upon the sulphuric acid digests by flame atomic absorption spectrophotometry. Different burners and different heights of the radiation beam in the flame conditions have been assessed. The accuracy of the method in foods has been evaluated for the levels of each element present. A satisfactory accuracy in method was observed for all except for manganese which showed higher value. BSN
- 2604 THOMPSON (KC) and WAGSTAFF (K). Some observations on the determination of iron by atomic-absorption spectrophotometry using air-acetylene flames. *Analyst.* 105(1252); 1980; 641-50
- 2605 LAMOUREUX (CH) and FEIL (VJ). Gas chromatographic and mass spectrometric characterization of impurities in technical methoxychlor. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 1007-37
- 2606 HOWARD (JW) and FAZIO (T). Analytical methodology and reported findings of polycyclic aromatic hydrocarbons in foods. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 1077-104
- 2607 HEIKES (DL) and GRIFFITT (KR). Gas-liquid chromatographic determination of pentachlorophenol in mason jar lids and home canned foods. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 1125-7
- 2608 KIOSSOWSKA (BM). The use of combined gas chromatography - mass spectrometry for the identification of aliphatic carboxylic acid in smoke produced from two species of wood. *Acta Aliment. Pol.* 5(3); 1979; 301-10
- The GLC-MS technique was used for the identification of aliphatic carboxylic acids in smokes obtained from alder wood (*Alnus incana* L.) and fir wood (*Abies alba*). The identification procedure was based on comparing the analysed mass spectra in a data processing system with spectra obtained for carboxylic acid standards. Where standards were not available general fragmentation rules for carboxylic acids were applied, and the results were checked by means of interpretation maps and comparison with registry of mass spectral data. Smoke from alder wood appeared to have 11 aliphatic carboxylic acids, whereas smoke from fir wood contained only 8 such acids - those with chains longer than 5 carbon atoms were absent. AA
- 2609 CILLARD (J) and CILLARD (P). Behaviour of alpha, gamma and delta tocopherols with linoleic acid in aqueous media. *J. Am. Oil Chem. Soc.* 57(1); 1980; 39-42
- At a concentration of 0.05 mole of tocopherol per mole of linoleic acid, α -tocopherol was prooxidant, while the δ and γ -tocopherols were antioxidant.

At half this concentration, α -tocopherol was still prooxidant, while the δ - and α -tocopherols were even more antioxidant. Tocopherol oxidation increased in the order $\delta < \gamma < \alpha$. There was a relationship between the ability of a tocopherol to be easily oxidized by air and its prooxidant activity. The latter may be due to the formation of a perhydroxyl ($\cdot\text{OOH}$) radical, or a radical of the type ($\text{O}_2\cdot$, $\cdot\text{OH}$). KMD

FOOD MICROBIOLOGY

- 2610 HESSELTINE (CW) and WANG (HL). The importance of traditional fermented foods. *Bioscience*. 30(6); 1980; 402-4

The traditional fermented foods of several countries together with the organism involved, substrate, nature and uses of food and studies on nutritional value have been reported and discussed. BSN

- 2611 WASLIEN (CI) and STEINKRAUS (KH). The potential of microbial cells as protein for man. *Bioscience*. 30(6); 1980; 397-8

- 2612 MEYER (O). Using carbon monoxide to produce single-cell protein. *Bioscience*. 30(6); 1980; 405-7

Deals with the use of carboxyclobacteria in production of SCP and the raw materials needed and problems associated with production and acceptability. BSN

ALGAE

- 2613 VENKATARAMAN (LV), BECKER (WE), RAJASEKARAN (T) and MATHEW (KR). Investigations on the toxicology and safety of algal diets in albino rats. *Food Cosmet. Toxicol.* 18(3); 1980; 271-5

The feeding of drum dried alga to albino rats at dietary protein levels of 10 and 15% for 12 weeks did not show any significant toxicological or histopathological effects. Total liver cholesterol levels were lower in rats fed the algal protein diet than in the casein fed control group. KMD

MUSHROOM

- 2614 CHANG (ST). Mushrooms as human food. *Bioscience*. 30(6); 1980; 399-401

YEAST

- 2615 OSZLANYI (AG). Instant yeast. *Baker's Dig.* 54(4); 1980; 16-9

Describes the development of an instant yeast whose activity is equal to compressed yeast and which requires no refrigeration during storage and has got instant reactivation in a dough is described. Its packaging, hydration, glutathione release, functionality and uses in prepared mixes have been discussed. KAR

FOOD ADDITIVES

- 16 TAKAHASHI (O), HAYASHIDA (S) and HIRAGA (K). Species differences in the haemorrhagic response to butylated hydroxytoluene (BHT). *Food Cosmet. Toxicol.* 18(3); 1980; 229-35

There were wide variations in the haemorrhagic effects of BHT. Rats were generally susceptible to the haemorrhagic effects of BHT, although those of the Donryu strain were more resistant than the other strains tested. Female rats were more resistant to haemorrhagic effects of BHT than were the male rats. Guinea pigs and ddy mice showed some haemorrhagic response to BHT administration. No haemorrhages were induced in the other species tested, although following BHT administration significant reductions in prothrombin levels were observed in ddy, BALB/CA and C57BL/6 mice and in Japanese quail. Dogs were resistant to the haemorrhagic effects of both BHT and TBP. KMD

- 617 TOYODA (M), OGAWA (S), TONOGAI (Y), ITO (Y) and IWAIDA (M). Gas-liquid chromatographic determination of tertiary-butylhydroquinone (TBHQ) in dried fish, frozen shrimp, vegetable oils, butter, and margarine. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 1135-7

Tertiary-butylhydroquinone (TBHQ) is extracted from foods with ethyl acetate, the solvent is evaporated, the residue is dissolved in *n*-hexane-ethyl acetate (99+1), and the TBHQ is selectively transferred into an aqueous layer (2% sodium chloride) as a separation from food interferences. Finally, TBHQ is reextracted with *n*-hexane-ethyl acetate (1+1), concentrated, and determined by flame ionization gas-liquid chromatography. Dried fish, frozen shrimp, vegetable oils, and edible fats were analyzed by the method. More than 85% was recovered when the samples were fortified with 100 ppm TBHQ. Detection limit was 1.0 ppm TBHQ. AA

- 618 CHALLIS (BC) and SHUKER (DEG). Chemistry of nitroso compounds. Part 16. Formation of N-nitrosamines from dissolved NOCl in the presence of alkanolamines and related compounds. *Food Cosmet. Toxicol.* 18(3); 1980; 283-8

Powerful nitrosating agents capable of forming N-nitrosamines readily under mild, nonacidic conditions are generated by interaction of alkanolamines and related compounds with nitrosyl gases. Since these reactions apply to N_2O_4 as well as NOCl and triethanolamine quantitatively absorbs NO_2 from dilute gas streams these reactions probably contribute to the formation of N-nitrosamines in consumer products containing alkanolamine emulsifiers. KMD

- 619 YAMAMOTO (M), YAMADA (T) and TANIMURA (A). Volatile nitrosamines in human blood before and after ingestion of a meal containing high concentrations of nitrate and secondary amines. *Food Cosmet. Toxicol.* 18(3); 1980; 297-9

Samples of human blood taken before and after ingestion of a Japanese meal containing high concentrations of nitrate and secondary amines were analysed for volatile nitrosamines. Nitrosodimethyl amine was detected in all 32 blood samples from eight donors in amounts ranging from a trace (< 0.5 ng/ml) to 1.3 ng/ml. The ingestion of the test meal had no clear effect on the blood levels of nitrosamines during the subsequent 2 hours. The results of this study provide some support for the possibility of nitrosamine formation in the lower gastro-intestinal tract. AA

- 620 BOLEY (NP), BUNTON (NG), CROSBY (NT), JOHNSON (AE), ROPER (P) and SOMERS (L). Determination of synthetic colours in foods using high-performance liquid chromatography. *Analyst.* 105(1251); 1980; 589-99

A method is proposed for the extraction, separation, identification and quantitative measurement of synthetic organic colouring materials in a wide range of foodstuffs. The colours are extracted with a liquid anion exchange resin, and where irreversible binding of colours to the food has occurred during processing, the colours are released by a preliminary enzyme digestion prior to extraction, then re-extracted from the resin followed by concentration by chromatography on polyamide. Final eluate is concentrated and examined by high performance liquid chromatography. The limit of detection is 1 mg kg⁻¹. Recovery values for most colours was 80% or better with reproducibility of 5%. BSN

- 2621 HAVELAND-SMITH (RB) and COMBES (RD). Screening of food dyes for genotoxic activity. *Food Cosmet. Toxicol.* 18(3); 1980; 215-21

The results of using liquid screening mutation test systems with a range of synthetic colourings prepared to foodstuffs specifications have been reported. Genotoxicity was also assessed using a bacterial DNA repair test in order to screen for compounds inducing nonmutational DNA damage. Mutational changes in DNA were detected in fluctuation tests using the three tester strains *Salmonella typhimurium* TA 1538, *S. typhimurium* TA 1535 and *Escherichia coli*. The data showed that under the conditions used and with the screening methods adopted, the majority of the 25 food colours tested, were not genotoxic. KMD

- 2622 HAVELAND-SMITH (RB) and COMBES (RD). Genotoxicity of the food colours red 2G and brown FK in bacterial systems: Use of structurally-related dyes and azoreduction. *Food Cosmet. Toxicol.* 18(3); 1980; 223-8

The genotoxic effects of two dyes Red 10B and Red 6B, which are structural analogues of Red 2G, have been observed. The results show that whilst Red 6B was inactive under all conditions, Red 10B was genotoxic without activation. Red 2G and Brown FK were subjected to anaerobic *in vitro* incubation with whole cell rat caecal extracts prior to testing with or without microsomes. The indirect genotoxicity of Red 2G was reduced after caecal pretreatment. Although the direct activity of Brown FK was reduced, the indirect activity of the dye was either unaffected or slightly enhanced according to the genetic systems used. KMD

- 2623 JADHAV (SS) and KULKARNI (PR). Pressor amines in foods. *J. Food Sci. Technol. (India)* 18(4); 1981; 156-7

Some cereals, legumes, fish, vegetables, fruits and dairy products which are commonly consumed in India were analysed for histamine, serotonin and tyramine. Histamine was maximum in ripe tomato (11.1 µg/g) followed by cow pea (9.5 µg/g). Serotonin was maximum in prawn (6.5 µg/g), raw banana (5.9 µg/g) and whole soyabean flour (5.8 µg/g). Maximum content of tyramine was found in apple (3.6 µg/g), Bombay duck and whole bajra flour (each 2.6 µg/g). KAR

CEREALS

- 2624 SHARMA (U). Contribution of HYVs to cereal output, yield and area in Gujarat. *Indian J. Agric. Econ.* 36(1); 1981; 79-81

It has been assumed that the yield of grain per unit area would increase more and more rapidly as the area under high yielding varieties (HYVs) increases. But, in India, this assumption could be confirmed only in the case of wheat, and to a lesser extent in the case of bajra and maize; in contrast, no

such improvement was observed in the case of jowar and rice. Hence, a study of the yield pattern was made of the five cereals (bajra, jowar, maize, paddy and wheat) and of the total foodgrains grown in Gujarat State. In the case of wheat and jowar, all the three parameters-output, yield, and area under cultivation-showed substantial increases. The growth rate for output and area under cultivation also showed increases in the case of bajra and total foodgrains. But the yield per unit area did not show any such remarkable increase in the case of bajra. The reason for this remains to be investigated. KMD

MERCIER (C). Structure and digestibility alterations of cereal starches by twin screw extrusion cooking. *Getreide-Mehl Brot.* 39(2); 1980; 52-6 (German)

The behaviour of different cereal starches was examined in the twin screw extruder type BC45. The structural modifications of extruded starch including the *in vitro* and *in vivo* digestibility were studied. The hot extrusion with twin screw extruder gave extrudates of higher digestibility during the processing of cereal starches. The decrease in the solubility of the starch prevents the formation of viscous structures by the complex formation of amylose fraction and improves the total sensory value of the end product. KMD

6 EKPENYONG (TE). The nutritional value of two cereal-based foods in Nigeria. *Food Chem.* 5(4); 1980; 315-23

Reports the nutritional evaluation of two cereal-based foods fortified with soyabean flour, vitamins and minerals. KAR

PADDY

7 VENKATESAN (V), ANTHONI RAJ (S), SINGARAVADIVEL (K) and VASAN (BS). Packaging systems for protecting high moisture paddy. *J. Food Sci. Technol.* (India) 18(4); 1981; 163-5

Due to rain or cyclonic weather, paddy crop gets wet and it is difficult to dry the grains in such inclement weather. Twenty four types of packagings and their combinations were tried to control air entry and to preserve the moist paddy from germination, mould growth and caking. A combination of gunny plus polyvinyl chloride (150 gauge) plus high density polyethylene (300 guage), prevented air entry and preserved paddy from contamination for 6 days. KAR

28 VENKATESWARLU (B) and SOMASUNDARA RAO (V). Prevention of germination and spoilage of submerged paddy. *J. Food Sci. Technol.* (India) 18(4); 1981; 161-3

Paddy crop at harvest time gets drenched either due to rains or breakage of stem by cyclonic winds. Panicles were artificially wetted by keeping under water for 2 days to simulate the field wetting and were dipped in 5% common salt solution, threshed and stored in (i) gunny bag, (ii) poly coated gunny bag and (iii) polythene bag for 10 days and observed for germination, mould growth, discolouration, off-odour and caking. It was found that NaCl treated paddy stored in (i) remained in good condition for 10-12 days than those stored in (ii) or (iii). This requires 75 kg salt costing Rs. 22-50 to treat paddy crop from one acre. KAR

RICE

- 2629 EL BAYA (AW), NIERLE (W) and WOLFF (J). Loss of substance during rice cooking. *Getreide-Mehl. Brot.* 34(2); 1980; 43-6 (German)
 During cooking of rice in excess water, around 1 to 6% of the dry mass, depending on the kind of rice, or pretreatment of the rice, pass over to the boiling water. The loss of minerals and fats is considerably higher than that of protein. Depending upon the kind of rice, the cooking water has a different amino acid spectrum for each kind of rice. The cooking water contains saccharose, glucose and trisaccharides, in different concentration, and in addition, surface fats and starch-fats and protein-fats. The quantity and the type of the fats dissolved out depend on the pretreatment of the rice. KMD
- 2630 ZURITZ (CA) and PAUL SINGH (R). Mathematical modeling of rough rice drying in a spouted bed. *J. Food Process. Eng.* 4(1); 1980; 19-52
 A theoretical model, based on the well-known mass and energy transport equations for a continuous media, was rigorously developed to describe the liquid diffusion controlled drying of cereal grain in a batch operated, well-mixed spouted-bed dryer. The equilibrium moisture content equation and the effective diffusion coefficient are required to solve the heat and mass transfer equations. Numerical techniques were used to solve these equations. The model was tested using laboratory-scale experiments where rough rice was dried in a spouted-bed. A good agreement was obtained between the experimental and theoretical model. AA
- 2631 GANGOPADHYAY (S) and CHAKRABARTI (NK). Mycotoxins in stored rice. *Curr. Sci.* 50(6); 1981; 272-5
 8 month old (a) raw, (b) single and (c) double parboiled rice collected from different villages in Orissa state were evaluated for mycotoxins. Results showed that the moisture of (c) was 20.5 to 22.5% compared to 13.5 to 19.5% in (b) and 12.3 to 17.5% in (a). *Aspergillus flavus* and *Fusarium moniliforme* were 22.4-29.2 and 23.8-32.5% in (c), 17.9, 24.5% and 22.5 - 30.8% in (b) and 12.9 - 19.5 and 19.8 - 30.5% in (a) respectively. Aflatoxin B₁ from rice infected with *A. flavus* could be traced spectrophotometrically with UV absorption peaks at 265 nm and 363 nm, absorption with wave numbers of 13410 and 21808 respectively and maximum fluorescence emission of 425 nm and Rf value on silica gel 0.56. Toxin extracted from rice infected with *F. moniliforme* yielded yellow crystals with scanning spectrophotometric peaks between 227 nm and 323 nm with the absorption wave numbers of 47260 and 58358 and maximum fluorescence emission 450 nm and of Rf value on silica gel 0.68. This unidentified toxin seemed to be very close to zearalenone. Toxicity of the above toxins were also evaluated using rabbits and decrease in body weight increase in eosinophil, lymphocyte in blood and black stool of rabbit were observed. MVG
- 2632 ANURADHA BHAT SONDI, MOHAN REDDY (I) and BHATTACHARYA (KR). Effect of processing condition on the oil content of parboiled rice bran. *Food Chem.* 5(4); 1980; 277-82
 The oil content of residual milled kernel was consistently lower and of bran higher in parboiled as compared to raw rice at all degrees of milling (d.m.), showing that the rice oil migrated outwards upon parboiling. However, the d.m.-oil content curves for the residual kernel as well as the bran were largely unaffected by varying conditions of parboiling. The total oil content of the grain was also unchanged after parboiling. When the data for the fraction of the total grain oil coming into the bran were plotted against the d.m. for a variety of parboiling conditions, they again fell into a single

line. These results showed that, contrary to many earlier claims, the processing condition during parboiling had no effect on the redistribution of the fat in the grain. AA

WHEAT

- 2633 KAMINSKI (E), STAWICKI (S), WASOWICZ (E), GIEBEL (H), PRZYBYLSKI (R), ZAWIRSKA (R) and ZALEWSKI (R). Volatile flavour compounds produced by bacteria cultivated on grain media. *Acta. Aliment. Pol.* 5(3); 1979; 263-74

The bacteria growing on wheat and corn grain produce a number of volatile chemical compounds responsible for the unpleasant sour, sour-milk and putrid smells. With the aid of GLC/MS analysis, 46 chemical compounds produced by bacteria on cereal grain have been identified. The following compounds were produced by bacteria in greatest quantities: acetoin, acetone, acetoin acetate, methylallylacetate, vinyl acetate, volatile fatty acids and amines. AA

- 2634 MacRITCHIE (F). Protein and lipid interaction in baking quality of wheat flours. *Baker's Dig.* 54(5); 1980; 10-3

RYE

- 2635 ZELAZOWSKA-MAJOR (Z) and JAKUBCZYK (T). Sugars occurring in rye flour, bread and rye bakery semiproducts. *Acta. Aliment. Pol.* 5(3); 1979; 195-205

Relationships between the quantitative composition of sugars present in the rye flour, bread and rye bakery semiproducts, and the quality of the bakery goods, were investigated. Fructose, glucose (alpha and beta), saccharose, alpha-maltose, maltotriose and sorbite were found to be present in rye flours. Moreover, 7 to 9 spots probably corresponding to glucofructosanes were noticed under maltose on the paper chromatographs. In rye bread and semiproducts the same sugars as in flour were found but in much greater quantity, as well as beta-maltose. The increased content of sugars observed at intensified amyolytic activity had a favourable effect of the evolution of CO₂ and the volume of bakery products. AA

OAT

- 2636 VRATANINA (DL) and ZABIK (ME). Bran as a source of dietary fibre in oatmeal cookies. *J. Am. Diet. Assoc.* 77(1); 1980; 26-30

MILLETS

- 2637 GUPTA (HO) and JOGINDER SINGH. Developmental changes in kernel fractions and dietary fibre of normal and opaque-2 maize (*Zea mays* L.). *J. Food Sci. Technol.* (India) 18(4); 1981; 142-6

Development and variations in (i) crude fibre (ii) neutral detergent fibre, (iii) acid detergent fibre, and (iv) hemicellulose were determined in opaque-2 ('Shakti' var.) and normal ('Ganga' var.) of maize after 25,30,35 days of pollination and at maturity. Marked differences in (i) - (iv) were observed in whole kernel, pericarp and endosperm of both the varieties. In the pericarp of both the varieties (i) - (iv) increased, but in whole kernel, only

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(i) decreased with kernel development. In normal maize kernel (ii) and (iv) were maximum after 30 days of pollination, whereas in opaque-2 they were maximum 35 days after pollination. The level of (iii) was maximum at 35 days in both the varieties. The % pericarp decreased and % embryo increased during development in both the varieties. Opaque-2 kernel contained lesser pericarp and higher proportion of embryo than normal variety of maize. KAR

- 2638 GRAHAM (GG), GLOVER (DV), De ROMANA (GL), MORALES (E) and MacLEAN (WC) JR. Nutritional value of normal, opaque-2 and sugary-2 opaque-2 maize hybrids for infants and children. 1. Digestibility and utilisation. *J. Nutr.* 110(5); 1980; 1061-9

Digestibility of energy and protein and protein quality of normal, opaque-2 (O_2) and sugary-2 opaque-2 (Su_2O_2) both as endosperm (E) and whole kernel (WK) meals were studied in children for 10-25 months of age. Apparent or retention from E meals was more than from WK meals; however both were lower than from casein. KAR

- 2639 GHALI (Y), IBRAHIM (N), GABA (S) and AZIZ (H). Modification of corn starch and fine flour by acid and gamma irradiation. Part 1. Chemical investigation of the modified products. *Starch.* 31(10); 1979; 325-8

Fine flour from corn and the isolated starch were dextrinized in the presence of acid and irradiated with γ -rays. Starch irradiated with high doses of γ -rays was highly modified while fine flour was less affected. The irradiated starch was reduced with sodium borohydride and then hydrolysed. Erythritol and other compounds were identified in the hydrolysate. It was concluded that the C_2-C_3 bonds in the intermediate glucose units are probably broken by irradiation. Such a hypothesis was confirmed by periodate oxidation, hydrolysis with α -amylase and ferricyanide number determination of the irradiated starch. AA

- 2640 PARKANY-GYARFAS (A) and VAMOS-VIGYAZO (L). Determination of amylase activity in corn using a chromogenic substrate. *Starch.* 31(10); 1979; 328-32

PULSES

PEA

- 2641 GWIAZDA (S) and KOCON (J). The influence of the drying method on microstructure, physicochemical and sensoric properties of pea protein concentrates. *Acta. Aliment. Pol.* 5(2); 1979; 71-80

The effects of spray and drum drying conditions on microstructure, physico-chemical and sensoric properties of pea protein concentrates were investigated. It was found that drum dried concentrate has a better water and fat absorption capacity and sensory properties compared to the spray dried concentrate. AA

- 2642 VAZQUEZ (A) and CALVELO (A). Gas particle heat transfer coefficient in fluidized pea beds. *J. Food Process. Eng.* 4(1); 1981; 53-70

Heat transfer coefficients were determined for both, peas and porous alumina pellets, in a system where particles were dried by the fluidizing air. Transfer coefficients were evaluated for various gas velocities and bed depths. KAR

- 3 KAVADIA (VS) and PAREEK (BL). Residues of phorate, carbaryl and endosulfan in peas (*Pisum sativum*). *J. Food Sci. Technol. (India)* 18(4); 1981; 149-51
- Residues of phorate in soil treated with 1.5 kg active ingredient/ha and in pea plants (whole, pods, and grains) grown on it and foliar applications of 0.1 and 0.2% carbaryl suspension and 0.05 and 0.1% endosulfan emulsion in/on plants were estimated. Phorate residues persisted for 90 days in soil and about 30-60% of that was absorbed by plant; at 90 days the amount in the pod was below detectable level. Carbaryl and endosulfan were below detectable level in pea grains after 21 days after application. KMAR

KESRI DHAL

- 4 MAITREYI NAG and GUHA (SR). Inhibition of monoamine oxidation of Guinea pig liver mitochondria by extract of *Lathyrus sativus* seeds. *Curr. Sci.* 50(5); 1981; 230-2

In vitro effects of *Lathyrus sativus* (LS) extract on monoamine oxidase (MAO) and amine tetrazolium reductase (MADH) systems of Guinea pig liver mitochondria were studied. With crude and partially purified LS extract, the % inhibition of MAO were 29.4 and 17.5 and of MADH were 31.5 and 20.2 respectively. The decreased inhibitory effect in partially purified extract indicates that some of the toxic principles got lost or inactivated during purification. MVG

BROAD BEAN

- 45 AL-NOURI (FF), SIDDIQI (AM) and MARKAKIS (P). Protein supplementation of broad beans with sesame. *Food Chem.* 5(4); 1980; 309-13
- Feeding experiments with weaning rats indicated that the protein of broad beans (*Vicia faba* var. major) and sesame (*Sesamum indicum*) are mutually supplementary. A standard diet in which 75% of the protein was provided by broad beans and 25% by sesame had a protein efficiency ratio (PER) of 2.36 compared to a casein PER adjusted to 2.50. A similar diet in which broad beans and sesame contributed equal amounts of protein had a PER of 2.41. The PER of broad beans was 0.99 and that of sesame 1.55. AA

BENGAL GRAM

- 46 ARYA (SS). Effect of water activity on storage changes in total carotenoids and lipids in Bengal gram (*Cicer arietinum*) dhal and flour. *J. Food Sci. Technol. (India)* 18(4); 1981; 139-42
- Bengalgram flour and dhal were equilibrated to 2.0, 8.0, 10.8, and 13.9% moisture at 0.0, 0.33, 0.57 and 0.73 water activity (a_w) respectively. Storage at 0.57 a_w does not cause perceptible change in flavour for 24-52 weeks but at 0.73 a_w it became moldy and developed musty odour in 8 weeks of storage. When a_w was 0.57, changes in total carotenoids, thiobarbituric acid value, free and bound lipids and their composition were not significant, except slight hydrolysis of triglycerides and a concomitant increase in fat acidity. Free and bound lipids and carotenoids were degraded during storage at 0.73 a_w . Proportions of neutral, glyco and phospholipids in bengalgram flour are 93, 3 and 4% in free lipids and 15.8, 16.9 and 66.9% in bound lipids respectively. Proportion of phospholipids in bound lipids decreased while neutral lipids increased during storage at 0.73 a_w due to mold infection. AA

WINGED BEAN

- 2647 DOBO SASSI BLAISE and ONUMA OKAZIC (B). Baking and organoleptic quality of composite flour bread with winged bean, triticale and wheat. *Baker's Dig.* 54(6); 1980; 22-4, 33-5

Along with SSL treatment, defatted winged bean flour can be used at levels up to 20% and full fat flour up to 15% with wheat to produce a quite acceptable bread. Using wheat and triticale flours together with defatted winged bean flour, the 5/45/50, 10/40/50 combination with or without SSL gave the most acceptable breads. With full fat winged bean flour, the 5/45/50 and 10/40/50 combination, with or without SSL gave the most acceptable breads. Use of upto 20% winged bean flour with wheat or 15% with triticale results in the improvement of the protein content of the bread by 65 to 78%. KAR

LOCUST BEAN

- 2648 EKA (OU). Effect of fermentation on the nutrient status of locust beans. *Food Chem.* 5(4); 1980; 303-8

Fermentation resulted in an increase in protein and fat contents, whereas carbohydrate content decreased. Fermentation resulted in the increase in most of the amino acids except arginine, leucine and phenylalanine. KAR

OILSEEDS AND NUTS

- 2649 COLE (ER), CRANK (G) and SHEIKH (AS). Fatty acid and glyceride composition of *Jubaea spectabilis* palm oil. *J. Am. Oil Chem. Soc.* 57(1); 1980; 23-5

Determination of the fatty acid distribution in three samples of oil from the kernels of the palm *Jubaea spectabilis* native to Chile, shows that the uniquely low melting point of the oil is due to a higher content of shorter chain fatty acids than other members of the subclass cocoideae. AA

- 2650 KAWAMURA (K). The DSC thermal analysis of crystallization behaviour in palm oil. II. *J. Am. Oil Chem. Soc.* 57(1); 1980; 48-52

SOYABEAN

- 2651 KOZLOWSKA (H), ELKOWICZ (K), LOSSOW (B) and SMITH (OB). The structural modification of vegetable protein preparations by high and low pressure extrusion-cooking processes. *Acta Aliment. Pol.* 5(2); 1979; 81-5

Flours and concentrates obtained from the soyabean and rapeseed, and soyabean-rapeseed blends (1:1), were textured by high and low pressure. The structures of protein preparations by extrusion-cooking processes were investigated using scanning electron microscopy. AA

- 2652 BARYLKO-PIKIELNA (N) and JAKUBOWSKI (A). Technological combining of various protein raw materials for obtaining predetermined functional and nutritive properties of protein preparations. *Acta Aliment. Pol.* 5(2); 1979; 157-64

Basing on previous technological experiments a simple process of combining two protein raw materials (defatted soyabean meal and skim milk) was elaborated in order to obtain protein preparation of favourable and reproducible technological and nutritive characteristics. The effect of processing parameters (ratio of raw materials, drying temperature) on properties of obtained

preparations was studied for choosing optimal conditions of proposed process.
AA

- 2653 KORITALA (S), FRIEDRICH (JP) and MOUNTS (TL). Selective hydrogenation of soyabean oil: X. Ultra high pressure and low pressure. *J. Am. Oil Chem. Soc.* 57(1); 1980; 1-5
- 2654 MITAL (BK) and STEINKRAUS (KH). Fermentation of soy milk by lactic acid bacteria. A review. *J. Food Prot.* 42(11); 1979; 895-9
- 2655 JOHANSSON (LE). Copper catalysts in the selective hydrogenation of soyabean and rapeseed oils : IV. Copper on silica gel, phase composition and preparation. *J. Am. Oil Chem. Soc.* 57(1); 1980; 16-22

GROUNDNUT

- 2656 SANDERS (TH). Effects of variety and maturity on lipid class composition of peanut oil. *J. Am. Oil Chem. Soc.* 57(1); 1980; 8-11
Oil was extracted from peanuts, using two solvents: (a) chloroform/methanol (2:1 v/v) and (b) petroleum ether. Three varieties of mature peanuts were found to be quantitatively similar in relative percentages of lipid classes, regardless of extraction solvent. The oil extracted with petroleum ether from a single variety at different stages of maturity was also studied. Generally speaking, the triglycerol percentage increased, and the percentages of all other fractions decreased with maturity. The calculated weight per seed also increased in close correspondence with the apparent physiological maturity of the seed. It may be concluded that (a) some fractions which might influence oxidative stability vary considerably with peanut maturity; and (b) if immature peanuts are used, they should be closely monitored for high oil quality. KMI
- 2657 SANDERS (TH). Fatty acid composition of lipid classes in oils from peanuts differing in variety and maturity. *J. Am. Oil Chem. Soc.* 57(1); 1980; 12-5
The oil and oil fractions of the Starr variety of peanut generally contained more 16:0 and 18:2 and less of 18:1 fatty acids than the oils from the Florunner and Florigiant varieties. Long-chain fatty acids (C20-C24) were generally more predominant in the sn-1, 3-diacylglycerol fraction than in other fractions. An unusual compound associated with this fraction was detected by GLC. Generally the concentration of 18:1 acid increased and that of all other acids decreased with maturity. Since there is a high correlation between seed size and maturity, the quality factors used by the industry can be correlated to seed size. KMD

BAMBARA GROUNDNUT

- 2658 POULTER (NH) and CAYGILL (JC). Vegetable milk processing and rehydration characteristics of bambara groundnut (*Voandzeia subterranea*(L) Thouars). *J. Sci. Food Agric.* 31(11); 1980; 1158-63
For preparing milk, the whole seed flour was homogenised in water with coconut or soyabean oils which yielded an emulsion containing 20 g protein and 30 ml oil/litre. KAR

COTTON SEED

- 2659 CHAWLA (PR) and KAKKAR (AK). Evaluation of residues of six recommended insecticides on cotton. *J. Food Sci. Technol. (India)* 18(4); 1981; 152-5
- Cotton crop was sprayed with (i) DDT, (ii) benzene hexachloride (HCH), (iii) endosulfan, (iv) fenitrothion, (v) quinalphos and (vi) carbaryl in 1978 to control jassids and the residue levels in cotton seed was determined. The six sprays applied to the crop left a residue of 0.06-1.70, 0.22-0.25, 0.06, 0.16 and 0.22 ppm in (i), (iii), (iv), (v) and (vi) respectively in cotton seed. KAR

RAPESEED

- 2660 DAUN (JK) and DAVIDSON (LD). Evaluation of the Tes-Tape and Tes-Stick procedures for estimating the glucosinolate content in rapeseed. *J. Am. Oil Chem. Soc.* 57(1); 1980; 52

Tes-Tape and Tes-Stick are two rapid procedures for the estimation of glucosinolates in rapeseed. Tes-Stick is merely a simplification of Tes-Tape in kit form. Both the tests were able to indicate correctly whether the rape seed sample was of the "Canola" variety (glucosinolates $\leq$ 3 mg/g as 3-butenyl isothiocyanate, and erucic acid $\leq$ 5%) or not. The test failed only when the glucosinolate levels were very close to the limit of 3 mg/g. KMD

NUT

- 2661 ANON. The nut harvest in the U.S.A. *Gordian*. 80(4); 1980; 57 (German)

ARECANUT

- 2662 BHIDE (S), CHOWDHURY (A), HEADY (EC) and MURALIDHARAN (MA). Structural changes in an agricultural assembling market: A case study of arecanut (betel-nut) market in Mangalore, Karnataka State. *Indian J. Agric. Econ.* 36(2); 1981; 25-34

The purpose of this study was (i) to analyse the structural changes in the arecanut assembling market at Mangalore which handles one-sixth of the total value of arecanut production in India, by using data on size distribution of firms and coefficients of inequality; (ii) to project the distribution of firms in different size categories by using mark on chain analysis; and (iii) to analyse the impact of changes in the market structure, and a distribution of firms characterized by more equal distribution of share of market transactions. These findings may be of use to those concerned with agricultural marketing in the developing nations. KMD

- 2663 SHIVAPURKAR (NM), D'SOUZA (AV) and BHIDE (SV). Effect of betel-quid chewing on nitrite levels in saliva. *Food Cosmet. Toxicol.* 18(3); 1980; 277-81

An initial study of nitrite levels in the saliva of a small randomly selected group was undertaken and the variation of these nitrite levels following the chewing of betel-quid with or without tobacco was studied. A substantial rise in salivary nitrite followed betel-quid chewing by volunteers who never chewed tobacco, but no such increase occurred when tobacco and betel-quid were chewed together. Basal levels of salivary nitrite were also lower in habitual tobacco chewers than in nonchewers. However, salivary pH was increased by both types of test chew and particularly by the betel-quid alone. KMD

TUBERS AND VEGETABLES

POTATO

- 2664 KAUSHALYA GUPTA and WAGLE (DS). Effect of application of phorate on trypsin inhibitor in potato. *J. Food Sci. Technol. (India)* 18(4); 1981; 147-9
Phorate (O,O-diethyl S-(ethylthio) methyl phosphorodithioate) was applied to potato crop at 1.5 kg active ingredient/ha at planting (T₁), earthing up (T₂) or half the dose at planting and other half at earthing up (T₃). Leaf, stem and tubers were analysed for trypsin inhibitor units (TIU) and for tyrosine 70, 80 and 90 days after sowing. The TIU in control tubers was 84.00/g where as it was 21 in T₁, 90 in T₂ and 36 in T₃ after 90 days. Free tyrosine (M/g) in tubers was 90.00 in control and 102-103 in treated plots. No significant differences were observed in different types of applications of phorate. Protein content did not show much difference in treated and untreated samples. AA
- 2665 BIELAWNY (J). Influence of the content of mineral components on the viscosity of potato flour emulsions. *Lebensmittel-Industrie*. 27(4); 1980; 169-70
The influence of the sodium, potassium, magnesium, calcium, iron and phosphorus on the viscosity of the emulsions of potato flour of different origin was tested. It became evident that the viscosity increases with increasing contents of phosphorus, sodium, and potassium, but decreases as the calcium content increases. AA
- 2666 WOJNOWSKA (I), BEDNARSKI (W), POZNANSKI (S) and WERNER (W). Obtaining protein preparations from potato juice waters, and their characteristics. *Acta Aliment. Pol.* 5(3); 1979; 227-37
Attempts were made to recover proteins from the potato juice waters. Centrifuging, ultrafiltration or thermal coagulation methods were used. Proteins solubility, their lipophilic and aerating properties, wettability and the buffer capacity of the protein preparations obtained, were compared. AA
- 2667 GEORGE (DA). Determination of residues of fensulfothion and its metabolites in Chinese cabbage, Japanese radish and turnips. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 1109-13
A method was developed using a selective nitrogen-phosphorus detector to determine the combined total residues, as the oxygen analogs, of fensulfothion (O,O-diethyl O-(p-(methylsulfinyl)-phenyl) phosphorothioate) and its 3 metabolites. The procedure was used to determine harvest residues in Chinese cabbage, Japanese radish, and turnips treated with 2 application rates of fensulfothion. Residues found after application of 2 oz active ingredient(AI)/100 lineal ft. of row ranged from 0.026 ppm for Japanese radish to 1.543 ppm for turnip greens. When the application rate was doubled, the amount of residue found was approximately doubled. AA

LETTUCE

- 2668 SCHELSTRAETE (M) and KENNEDY (BM). Composition of miner's lettuce (*Montia perfoliata*). *J. Am. Diet. Assoc.* 77(1); 1980; 21-5
Reports data on proximate composition, minerals vitamins, oxalic and phytic acids of miner's lettuce, a wild edible plant grown in Western USA. BSN

TOMATO

- 2669 ALLEN (BH) and CHIN (HB). Rapid HPLC determination of hydroxymethylfurfural in tomato paste. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 1074-6

FRUITS

- 2670 MOHANDOSS (V), MRITHYUNJAYA and SUBRAHMANYAM (KV). Capacity utilization concepts and their relevance to costs and returns of fruits and vegetable cold stores. *Indian J. Agric. Econ.* 36(2); 1981; 59-69

Utilizing the information obtained from one, private apple storing unit (capacity 140 ton) and one, multi-commodity co-operative store (820 ton) in Bangalore city, an attempt has been made to develop a simple methodology for estimating the capacity utilization of fruit and vegetable cold stores. Two different concepts were developed to account for two kinds of difficulties: (a) net capacity utilization (NCU) to deal with the fact that commodities are stored for a few days only, with frequent withdrawals; and (b) economic capacity utilization (ECU) to deal with the fact that fixed monthly charges have to be paid by the user, even if a consignment is stored for a few days. As the latter practice is unfair to the users, the authors recommend that after the capacity utilization has reached a particular optimum, users be charged only for the actual number of days their consignment is stored. KMD

- 2671 HARRIS (JE) and DENNIS (C). Heat stability of endo-polygalacturonases of mucoraceous spoilage fungi in relation to canned fruits. *J. Sci. Food Agric.* 31(11); 1980; 1164-72

The heat resistance of endo-polygalacturonase (endo-PG) of the strawberry spoilage fungi, *Rhizopus sexualis*, *R. stolonifer* and *Mucor piriformis*, was compared to that of isolates of *R. arrhizus*, *R. stolonifer* and *R. oryzae* known to cause breakdown of canned apricots. All species produced endo-PGs in culture medium which showed marked heat tolerance and a bimodal heat stability. Heating for 10 minutes at temperatures between 30-120 C indicated that maximum inactivation occurred at 50-60 C. Stability increased from 70 C to 100 C and then declined, but in some cases activity remained even after heating at 120 C for 10 minutes. Similar trends in heat resistance were recorded for endo-PGs in infected tissue of apricot, peach, tomato and cherry fruits, whereas those in infected tissue of strawberry, raspberry and plum were rapidly inactivated at all temperatures above 40 C. The possible reasons for differences between fruits are discussed. AA

- 2672 YAMAMOTO (A), IWAMOTO (M) and HAGINUMA (S). Acoustic impulse response method for measuring natural frequency of intact fruits and preliminary applications to internal quality evaluation of apples and watermelons. *J. Texture Stud.* 11(2); 1980; 117-36

A nondestructive textural quality measurement technique that uses an acoustic property was studied for apples and watermelons. By means of digital Fourier analysis, the natural frequencies of intact fruits are obtained from the sound which is produced by hitting them with a wooden ball pendulum. The reliability of this method was confirmed. This method requires simpler instrumentation than the sonic vibrating resonance method. AA

GRAPE

- 2673 LEE (CY) and BOURNE (MC). Changes in grape firmness during maturation. *J. Texture Stud.* 11(2); 1980; 163-71

Puncture force with skin on, puncture force with skin off, deformability, and °Brix were measured on six cultivars of grapes grown in northeastern USA as they matured over a six week period. Deformability increased steadily throughout the maturation period. °Brix increased rapidly following veraison and then continued to increase at a slow rate. Both puncture forces decreased rapidly at veraison and then continued to decrease at a slower rate. The puncture force with skin on was always much higher than puncture force with skin off. All the physical properties correlated well with each other and with °Brix (with a few exceptions). The puncture test with skin on usually gave the highest correlation with °Brix. It could probably be used as an alternative test to °Brix or as a confirmatory test to supplement the °Brix reading. AA

SUGAR, STARCH AND CONFECTIONERY

SUGAR

- 2674 GUPTA (HN). Mill roller grooves : their juice handling capacities. *Proc. 44th Ann. Conv. Sugar Technol. Assoc. India.* 1980; E1-E20.

An attempt has been made to find out the juice handling capacities of different pitches and angles of grooves, on the basis of the findings of Solomon. After estimating juice velocity and juice load on feed rollers in several sugar factories, the required juice drainage area was worked out at different crushing rates, so that the proper pitch and angle of the grooves could be determined. A combination of a V-groove with a Messchaert groove was found to have the highest drainage area in a mill of size, 760 x 1520 mm, for groove pitches from 12.5 to 75.0 mm. KMD

- 2675 JOSHI (NN), GOEL (SK) and RAJ KUMAR. "Transient heater" for reheating final massecuites. *Proc. 44th Ann. Conv. Sugar Technol. Assoc. India.* 1980; E27-36

A "transient heater; is basically a heat exchanger with stationary heating elements, similar to a disc type calandria. The massecuite flows outside the elements, and the hot water flows inside the disc elements. Very encouraging results were obtained when such an element was fitted to one of the Walkonti 8/34 centrifugals. The transient heater resulted in a considerable saving in electrical energy, and reheated the final massecuites instantaneously. KMD

- 2676 KUMAR (G) and JAIN (SP). Improvement in injection water system. *Proc. 44th Ann. Conv. Sugar Technol. Assoc. India.* 1980; E37-E48

The water injection and spray system in a sugar factory has been modified, and the power consumption in this station has been reduced from 0.211 to 0.162 kW per tonne cane per day. The modifications described herein relate to: design of injection pit, spacing between the adjacent pumps, design of suction and discharge pipelines, and the height of the condenser above the water level. KMD

- 2677 GURUMURTHY (BS) and RAMASWAMY (CK). Distribution of heating surface in multiple effect evaporators. *Proc. 44th Ann. Conv. Sugar Technol. Assoc. India.* 1980; E63-E76

In a multiple effect evaporator, the heat transfer coefficient is highest in the first effect and lowest in the last. The authors have explained, with examples, how the maximum effect of evaporation can be obtained by proper selection of the heating surface and the temperature gradient for each effect. It is proved that there is definite, optimum combination of heating surface and temperature gradient for each effect, and a specific way of distribution of heating surface and temperature gradient has been suggested. KMD

- 2678 RAGHAVAN (TL), RAMASWAMY (GK) and VENKATAGIRI (KP). "RAG SAI" : A simple cane carrier drive. *Proc. 44th Ann. Conv. Sugar Technol. Assoc. India.* 1980; E77-E86

Simple automated instrumentation-called "RAG SAI", probably after the authors - has been developed for controlling the cane carrier drive. After installation of "RAG SAI", crushing of cane has been steady and trouble-free and the quantity of cane crushed per 24 hour of operation has exceeded previous records. There have been considerable savings in the consumption of energy as well as lubricants. KMD

- 2679 BHARGAVA (JC) and JAIN (VK). Steam economy in a sugar factory in India processing sugar beet in later part of season after sugar-cane season. *Proc. 44th Ann. Conv. Sugar Technol. Assoc. India.* 1980; E99-E126

The steam consumption in a small beet sugar factory can be reduced from 80.4% to 48.0 of the quantity of beet processed, by installing high pressure boilers (41 kg/cm²) with matching power generators. Bleeding of vapour from a quintuple effect evaporator is also recommended. KMD

- 2680 SRIMAN NARAYANA (P). A new formula proposed for reduced mill extraction. *Proc. 44th Ann. Conv. Sugar Technol. Assoc. India.* 1980; C9-C21

The author has postulated a new formula for reduced mill extraction (RME), based on the concept of pol retention factor, P, instead of the juice retention factor, V, and milling loss as advocated by Noel Deerr and B.L. Mittal. The new formula is based on a common standard basis of 12.5% fibre and 85% purity in cane and combines-so it is claimed - the advantages of both R.M.E. (Noel Deerr) and whole reduced extraction (Mittal). Correlation analysis between the three formula proves the superiority of the new formula. KMD

- 2681 MORE (PK). In need of normalization of performances. *Proc. 44th Ann. Conv. Sugar Technol. Assoc. India.* 1980; C35-C50

Reduced extraction is not a dependable measure of efficiency of performance; on the other hand, a dependable formula for efficiency should be based on reduced loss and utilized capacity. KMD

- 2682 SRIVASTAVA (AK). Colorimetric method for the determination of ammonia in condensate water. *Proc. 44th Ann. Conv. Sugar Technol. Assoc. India.* 1980; C51-C5

When a small quantity of Nessler's reagent is added to an ammonia-containing solution, it develops within 5 minutes a colour that produces an absorption maximum at 420 nm. The optical density of the ammonia solution treated with Nessler's reagent increases with the ammonia concentration. KMD

- 2683 AGARWAL (SKD) and UPADHYAYA (SK). A method for estimation of sulphur dioxide in white sugar by chloramine-T. *Proc. 44th Ann. Conv. Sugar Technol. Assoc. India.* 1980; C57-C87

The spectrophotometric method officially adopted by the ICUMSA (International Commission for Uniform Methods of Sugar Analysis) - involving the reaction of SO₂ with pararosaniline, in the presence of alkali and formation - is suitable only for SO₂ contents of 5-40 ppm, whereas the range of workability required is 0-70 ppm. As the iodometric titration method is also unsatisfactory, a new spectrophotometric method has been developed, using the reaction of SO₂ with chloramine-T in a highly acidic medium. The method is free from the defects of the other two methods, and can be used easily for SO₂ contents upto 100 ppm. KMD

- 2684 ATHAVALA (RD). A simple method for determination of "colour" of white sugar in solid form. *Proc. 44th Ann. Conv. Sugar Technol. Assoc. India.* 1980; C89-C92

An instrumental method, using the "LASERPHOT", for determining the "colour" of white sugar has been described. KMD

- 2685 THANGAMUTHY (P). Application of conductance method for estimation of ash in sugarcane products. *Proc. 44th Ann. Conv. Sugar Technol. Assoc. India.* 1980; C103-C8

Measurement of ash in sugar is essential for judging the melassigenic property of sugar, and it is being ignored at present. The author has tried to correlate ash content with electrical conductance of sugar so that ash content can be determined by measuring conductance. KMD

- 2686 GUPTA (AP), SHUKLA (SP) and TEWARI (KM). A new optical method for estimation of colloids. *Proc. 44th Ann. Conv. Sugar Technol. Assoc. India.* 1980; C109-C17

The new method is based on the principle that a colloidal solution can be coagulated by oppositely charged colloidal dye solutions. The optical density of the supernatant solution decreases as the colloids coagulate, and reaches a minimum at the isoelectric point (complete coagulation). The amount of dye required for complete coagulation indicates the amount of colloids in the test solution. The method is simple and accurate. KMD

- 2687 SITTON (OC) and GADDY (JL). Ethanol production in an immobilized-cell reactor. *Biotechnol. Bioeng.* 22(8); 1980; 1735-48

- 2688 HARTMEIER (W) and TEGGE (G). Trials to oxidize glucose in mixtures of glucose and fructose by means of fixed glucose oxidase and catalase. *Starch.* 31(10); 1979; 348-53 (German)

The glucose oxidase catalase system from *Aspergillus niger* was fixed via glutardialdehyde binding on to particles of gelatin previously hardened by formaldehyde. Working and stability characteristics of the resulting enzyme preparation are given as a function of pH value, temperature and substrate concentration. The data are discussed with regard to the possible industrial use. AA

- 2689 BOHNENKAMP (CG) and REILLY (PJ). Use of immobilized glucoamylase- β -amylase and glucoamylase-fungal amylase mixtures to produce high-maltose syrups. *Biotechnol. Bioeng.* 22(8); 1980; 1753-8

- 2690 ZAJAC (A) and KUJAWSKI (M). The role of enzymes accompanying glucoamylase in the process of enzymatic saccharification of starch. *Acta Aliment. Pol.* 5(3); 1979; 207-16

The effect of accompanying amylolytic enzymes on the starch saccharification process using a glucoamylase preparation was investigated. The real

effect of transglucosylase on the glucose yield was determined. On the other hand, no action of α -amylase on this preparation was observed. AA

- 2691 RUGH (G), NIELSEN (T) and POULSEN (PB). Application possibilities of a novel immobilized glucoamylase. *Starch*. 31(10); 1979; 333-7
- 2692 GRIFFITHS (DR) and PRIDHAM (JB). The metabolism of 1-(ϵ -N-lysyl)-1-deoxy-D-fructose by *Escherichia coli*. *J. Sci. Food Agric.* 31(11); 1980; 1214-20
- 2693 BORUCH (M) and NEBESNY (E). Action of glucose isomerase on oligosaccharides in starch hydrolysates. *Starch*. 31(10); 1979; 345-7 (German)
- During investigation of glucose isomerization with glucose isomerase, it was found out that in particular circumstances the glucose isomerase was active not only against glucose, but also against oligosaccharides, which were present in starch hydrolysates. It was proved that glucose isomerase was capable of converting small amounts of maltose into an unknown ketodisaccharide and that it was capable of producing ketose residues in molecules of maltose homologous oligosaccharides. A particularly intensive action of glucose isomerase on maltose and on maltooligosaccharides was observed when solutions did not contain or contained only small amounts of glucose. AA
- 2694 MAHENDRA PRASAD. X-ray diffraction studies of sucrose and sucrose irradiated with γ -radiation. *Proc. 44th Ann. Conv. Sugar Technol. Assoc. India*. 1980; C1-C7
- Irradiation with γ -rays reduces the interplanar spacing 'd' in sucrose, thereby indicating partial damage to the sucrose lattice. KMD
- 2695 MAHENDRA PRASAD. Abnormal Brix and intermolecular orientation in sucrose-water systems. *Proc. 44th Ann. Conv. Sugar Technol. Assoc. India*. 1980; C93-C102
- The physical basis of Brix of a pure sucrose solution has been analyzed, in terms of a newly introduced parameter, the molecular ratio ψ , volume contraction, and specific gravity deviation. The limiting value of Brix predicted by this parameter is 95°, which agrees excellently with experimental data. The volume contraction shown by specific gravity data appears to be responsible for abnormal Brix. A model of symmetrical inter molecular orientation of sucrose molecules among themselves in the system is proposed; such a model is strongly supported by X-ray diffraction studies of a 65° Brix sucrose solution. KMD
- 2696 HERR (D). Conversion of cellulose to glucose with cellulase of *Trichoderma viride* ITCC-1433. *Biotechnol. Bioeng.* 22(8); 1980; 1601-12
- 2697 HAGERDAL (B), FERCHAK (JD) and PYE (EK). Saccharification of cellulose by the cellulolytic enzyme system of *Thermomonospora* Sp. I. Stability of cellulolytic activities with respect to time, temperature and pH. *Biotechnol. Bioeng.* 22(8); 1980; 1515-26
- 2698 FERCHAK (JD), HAGERDAL (B) and PYE (EK). Saccharification of cellulose by the cellulolytic enzyme system of *Thermomonospora* Sp. II. Hydrolysis of cellulosic substrates. *Biotechnol. Bioeng.* 22(8); 1980; 1527-42
- 2699 CHRAPKOWSKA (KJ), GEMBICKA (D) and JANICKI (J). Effectiveness of cellulases of *Armillariella mellea* (Fr. Ex Wahl) P. Karsten in releasing proteins from the aleuronic layer in barley and oats bran. *Acta Aliment. Pol.* 5(3); 1979; 217-25

A highly active preparation of cellulases from an edible fungus *Armillariella mellea* (Fr.ex. Wahl) P. Karsten was obtained. Its hydrolytic capacity to decompose cellulose in cell membranes of the aleuronic layer of barley and oats bran was determined. Application of successive treatment of the bran's initial processing with pronase and then in the cellulases obtained from *Armillariella mellea* rendered it possible to extract proteins almost completely from barley bran, and somewhat below that level from oats bran. AA

- 2700 BOSE (S) and SINGH (L). Dextran in sugar house products - A method for neutralization of its effect during polarimetric analysis. *Proc. 44th Ann. Conv. Sugar Technol. Assoc. India.* 1980; C23-C34

As dextran interferes in the analytical procedures employed in a sugar factor, attempts have been made to remove dextran from technical sugar solutions (or sugar-cane juices) by using different clarifying agents, prior to polarimetric analysis. Among all the agents tested, Herles reagent proved to be the best in precipitating dextran during the clarification stage; the polarizations of the resulting solution were the same as that of the blank sample. A sufficient amount of Herles reagent must be used for this purpose. KMD

- 2701 LASZLO (Von E), BANKY (B) and SZEJTLI (J). Determination of cyclodextrin-transglycosylase enzyme activity by means of C-labelled methyl- α -D-glucopyranoside. *Starch.* 31(10); 1979; 353-5

Converting the cyclic dextrans into open chain dextrans in the presence of C-labelled methyl- α -D-glucopyranoside is the basis of a new method for determination of the activity of cyclodextrin transglycosylase. On account of the disproportionate reaction as well as of the simultaneous action of hydrolytic enzymes which are also present in the fermentation liquid, a rapid chromatographic separation is a precondition of a reliable determination of the C radioactivity incorporated into the open chain dextrans. The method is laborious and time consuming. However, it is specific for the enzyme and is recommended in presence of other amylolytic enzymes when no reliable activity can be determined with other methods. AA

- 2702 ROELS (JA) and VAN TILBURG (R). Kinetics of reactions with amyloglucosidase and their relevance to industrial applications. *Starch.* 31(10); 1979; 338-45

- 2703 WHITE (JW) Jr. High-fructose corn syrup adulteration of honey: Confirmatory testing required with certain isotope ratio values. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 1168

MOLASSES

- 2704 KOCH (H-J) and SEETGE (H). Possibilities of decreasing the consumption of thermal energy for sterilization and distillation of molasses in yeast factories and distilleries (Part I). *Lebensmittel-Industrie.* 27(4); 1980; 157-62 (German)

The proposed measures result from a comprehensive analysis of the power economy in enterprises and production processes which are realized on the basis of the methods - explained in Part 2. Main subjects under considerations are the process stages of sterilization and distillation of molasses. AA

GUM

- 2705 CHRISTENSEN (O) and TRUDSOE (J). Effect of other hydrocolloids on the texture of kappa carrageenan gels. *J. Texture Stud.* 11(2); 1980; 137-47
- 2706 AINSWORTH (PA) and BLANSHARD (JMV). Effect of thermal processing on structure and rheological properties of carrageenan/carob gum gels. *J. Texture Stud.* 11(2); 1980; 149-62
- 2707 PLASCINA (G), FISKINA (NA), BRAUDO (EE) and TOLSTOGUZOV (VB). Furcellaran gel creep study. *Nahrung.* 24(6); 1980; 543-50

CONFECTIONERY

- 2708 JOHNCOCK (SIM) and WAGSTAFFE (PJ). Improvements in the determination of sugars in confectionery by high-performance liquid chromatography. *Analyst.* 105(1251); 1980; 581-8

CHOCOLATE

- 2709 LEHMANN (G) and GANZ (J). Polyamide powder as an aid in the determination of sugar in chocolates. *Gordian.* 80(4); 1980; 63 (German)
 After a chocolate has been clarified, the residual colour in the solution - due to cocoa pigments - can be removed with help of polyamide powder. The optical rotation of the solution can then be measured and the sugar content in chocolate powders determined. KMD
- 2710 RIEDEL (HR). Air conditioning and pest control. *Confect. Prod.* 46(7); 1980; 310-5

BAKERY PRODUCTS

- 2711 HICKEY (CS). Sorbate spray application for protecting yeast-raised bakery products. *Baker's Dig.* 54(4); 1980; 20-1,36
 Sorbate spray has been applied to prevent surface spoilage of bread, Hamburger buns, English muffins, brown and serve specialities and flour tortillas. Sorbate can also be applied to doughs. to increase the shelf life. KAR
- 2712 SEILER (K) and SEIBEL (W). Sensory evaluation of extrusion products. *Getride-Mehl Brot.* 34(3); 1980; 81-4 (German)
 A sensory evaluation scheme is introduced in the form of a general scale of quality, which is useful in evaluation of raw and finished extrudates based on cereals. This scheme can be denoted as a 5-point, scheme, which was derived from the DLG evaluation scheme for fine baked products. After the test characteristics of the extruder products have been formulated in the correct form a total sensory evaluation of commercial extruded products and raw extrudates has been undertaken, using the recommended method. Recommendation has also been made for the evaluation of products for the sake of awarding prizes. KMD

- 2713 WEBER (A) and SEIBEL (W). The new DLG-test scheme for evaluating the quality of baked goods. *Getreide Mehl Brot*. 34(3); 1980; 71-3 (German)

The 20-point scheme has proved good in the labelling of baked products. The disadvantages of the 20-point scheme is that it is confined to given 20-points. The new testing scheme evaluated the total quality more objectively on account of specific weight factors and corresponds to the requirements of a sensory analysis. The 5-point scale is preferred all over the world, as it is both descriptive as well as a scoring test.

- 2714 TSEN (CC). Yellow corn flour and meal used as a colouring agent in baking foods. *Baker's Dig.* 54(4); 1980; 24-5,8

Yellow corn flour added to replace 10 and 20% of the wheat flour on the weight enhanced the yellow colour of the cake crumb and slightly reduced the volume of crumb. Yellow corn meal with finer granulation was superior to flour. Reduction in absorption and development time occur as wheat flour was replaced by corn flour. However, no significant change in dough stability was observed upon replacement. In buns, corn flour at 5% replacement showed no change, but at 10% specific volume of buns was reduced by 6.2%; but the buns were more golden yellow in colour. KAR

BREAD

- 2715 PATEL (KM), HALLERBACH (CM) and BERGAN (JG). Frozen breads could be (Micro) wave of the future. *Baker's Dig.* 54(5); 1980; 6, 8-9

Limiting microwave exposure to 3.0 minute will minimize moisture loss and associated deteriorative changes as well as lower energy costs. Polyethylene packaging provided a more effective barrier against dehydration and is simpler to seal than wax bag packaging. KAR

- 2716 LAUTER (B). Handicraft production of "Baguettes" (i.e. French bread) *Getreide Mehl Brot*. 34(2); 1980; 34-7 (German)

Use of a large quantity of yeast with a short period of fermentation for each piece does yield a bread with a very fine appearance, but the other qualities associated with French bread can be obtained only with longer fermentation periods. Good results are not obtained if a gluten-rich flour is used. High rates of kneading and high dough temperatures are to be avoided. Dough temperatures of 24-26 C are recommended. In the case of spiral kneading machines, it is difficult to obtain dough temperatures of 24-26 C, together with long periods of kneading machines, it is difficult to obtain dough temperatures of 24-26 C together with long period of leading. In the manufacture of French white bread, cutting and moistening are the important processes. A defective cutting and excess of moistening would yield bread of poor quality. KMD

- 2717 JACKEL (SS). Trends in the usage of shortening in breads and rolls. *Baker's Dig.* 54(4); 1980; 32,34,36

The major trends in shortening use in the wholesale baking industry are towards (1) liquid vegetable oils, primarily soyabean and (2) reduced levels of shortening made possible by increased levels of emulsifiers and dough conditions. KAR

- 2718 TOGERSEN (R). Freezing of bread: The Norwegian system and its industrial use. *Getreide Mehl Brot*. 34(2); 1980; 37-9 (German)

The deep freezing system, also called the Norwegian system, is at present used in the bakeries, which control 30% of the Norwegian bread market. This

system allows a 50% rise in productivity by a better utilisation of 8-hour long working day. The system contributes to a better planning for delivery with trucks. The freezing of bread is considered as an interesting method, since the other alternative, i.e. warm storage, results in decolouration and changes in taste. KMD

- 2719 GARTI (N), LINDER (C) and PINTHUS (EJ). Evaluation of food emulsifiers in the bread baking industry. *Baker's Dig.* 54(5); 1980; 24,26,37
Of the different emulsifiers tested, only the Stearoyl actylate series of emulsifiers are the best single powdered conditioners and softeners for regular bread. The dough will tolerate increased water absorption without stickiness, will be very tolerant to mixing, will have better machining properties and will be sufficiently extensible. SSL and span 60 were found to be extremely good for some sugar rice doughs. KAR
- 2720 WURZIGER (J). EC guidelines for labeling of bread and other baked products. *Getreide-Mehl Brot.* 34(3); 1980; 67-71 (German)
EC (European Council) guidelines contain exact instructions for labeling of packed baked products. In the case of unpacked products the consumer must be informed adequately. Trade mark, list of contents, net quantity, date of expiry and address of the manufacturer must also be given. KMD
- 2721 LASZTITY (R). Rheological studies on bread at the technical university of Budapest. *J. Texture Stud.* 11(2); 1980; 81-115
The bread crumb exhibits elastic and plastic properties. The rheological properties change according to additives used. Change in rheological properties relates to increase or decrease in volume as well as the structure of crumb wall frame work. Total and plastic deformation increased as a result of addition of potatoes, milks of various fat contents, fats, surface active agents and gluten. Relative elasticity of the crumb of bread decreased in all cases, except in case of gluten. BSN
- 2722 JIM BROWN. The true role of fermentation in modern bread making. *Baking Today.* 1(1); 1980; 46-8, 53
Various aspects of fermentation have been discussed. With respect to changing methods and machinery. KAR

CAKE

- 2723 ABDEL-BAKI (MM), EL-SAMAHY (SK), SELEHA (H) and MORAD (MM). Cake-mix supplementation with soybean, sweet potato or peanut flours. 1. Chemical, microbiological and rheological studies. *Baker's Dig.* 54(5); 1980; 28-30
Defatted soybean and peanut flours were found to be higher in protein and some essential amino acid levels and lower in total microbial counts than wheat and sweet potato flours. The bacterial counts of eggs decreased after drying and the major bacterial population was the spore forming bacteria. However, no Salmonella existed in the egg samples. Adding the defatted soy, defatted peanut or sweet potato flours to wheat flour increased water absorption and dough development time and dough stability. KAR
- 2724 EL-SAMAHY (SK), MORAD (MM), SELEHA (H) and ABDEL-BAKI (MM). Cake-mix supplementation with soybean, sweet potato or peanut flours. II. Effect on cake quality. *Baker's Dig.* 54(5); 1980; 32-3,36
Acceptable cake was obtained when 10% peanut, 30% sweet potato and 15% soybean flours replaced the wheat flour. Dried or fresh egg did not affect

cake specific volume, but did affect consumer acceptability. KAR

MILK AND DAIRY PRODUCTS

- 2725 PATEL (RK). Economics of livestock enterprise with special reference to its employment potential. *Indian J. Agric. Econ.* 36(1); 1981; 34-8
This is a summary of the discussions held under subject III of the Conference-40th Annual of the Society of Agricultural Economics held at Pune (Maharashtra) from 30th Dec. 1980 to 1st Jan. 1981. The topics dealt with here relate to the need to improve the data base (i.e. statistics) on livestock and livestock products; the economics of milk production technology; estimation of milk production functions; crop-livestock integration; and the employment potential of animal husbandry occupations. It is feared that, just as in the case of the High-Yielding Variety, programme for crops, livestock improvement programmes, too, are likely to benefit the medium and large farmers, and relatively well irrigated regions. KMD
- 2726 PUHAN (Z). Heat treatment of cultured dairy products. *J. Food Prot.* 42(11); 1979; 890-4

MILK

- 2727 BILL ELSY. Survey of energy and water usage in liquid milk processing. *Milk Ind.* 82(10); 1980; 18-23
Aspects covered are : pattern of fuel and electricity usage; energy consumption for particular categories of dairies by size and product type; relationship between fuel and water usage, electricity and water usage, and possible energy saving. KAR
- 2728 Van De VOORT (FR). Evaluation of milkoscan 104 infrared milk analyzer. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 973-80
The Milkoscan 104, a single cell, dual wavelength infrared milk analyzer, was assessed to see if it would meet the newly set AOAC specifications for accuracy and reproducibility required for official sanctioning of the instrument for milk component analysis. This assessment was carried out using herd, individual cow, commercial, and composite random milks, and produced mean differences and standard deviations of difference of $<0.02\%$ and $\pm 0.02\%$ for reproducibility and $<0.05\%$ and $\pm 0.06\%$ for accuracy. Results outside these values were encountered in the individual cow milks, for which the instrument was not specifically calibrated. The average molecular weight of the milkfat was an important variable because 2 anomalous milks were present in the calibration milks, thus restricting the overall accuracy obtainable. Linear regression analysis of chemical vs instrumental results showed good linearity and provided standard errors of the estimate of the same magnitude as the standard deviation of the differences. A separate assessment of the instrument for within- and between-day variation showed no practical significant differences. Based on the overall results, the Milkoscan 104 was judged to be capable of meeting the AOAC specifications set for fat, protein, and lactose analysis. AA
- 2729 SAN (D), WILLIAMS (WF), ROCKMANN (D) and ALLEN (JT). Transfer coefficients of radionuclides secreted in milk of dairy cows. *J. Dairy Sci.* 63(9); 1980; 1447-50

- 2730 KIRST (E). On the lipolysis of milk due to technological influences. Part I. State of knowledge and studies on the effects of pumping. *Nahrung*. 24(6); 1980; 569-76 (German)

The increasing mechanization and automation of milk production and processing is likely to multiply the mechanical and thermal effects on milk. A short survey of changes occurring in milk fat is given. Determinations of "free fat", free fatty acids, enzyme activities and physical properties may, inter alia be used for assessing the extent of these changes. The methods of investigation most currently employed for this purpose are dealt with. Furthermore, the results obtained from a study on the effects of pumping on the milk are presented. The results indicate that displacement pumps should be preferred to centrifugal pumps as they cause much less damage to the milk fat. KMD

- 2731 PILLAY (VT), MYHR (AN) and GRAY (JI). Lipolysis in milk. I. Determination of free fatty acid and threshold value for lipolyzed flavour detection. *J. Dairy Sci.* 63(8); 1980; 1213-8

Two methods, the commonly used "Bureau of Dairy Industries" detergent procedure and a slightly modified version of the Frankel and Tarassuk method, were used to determine the extent of lipolysis in milk. Correlation coefficients were high for both the "Bureau of Dairy Industries" (0.95) and the modified Frankel and Tarassuk (0.88) methods when acid degree values obtained by each were correlated with time of storage following agitation of the milk. Acid degree values determined by the Bureau of Dairy Industries method correlated highly (0.96) with those values by the modified Frankel and Tarassuk method. The linear relationship and high correlation could be used for predicting acid degree values for one method from known values by the other. The threshold for lipolyzed flavour detection in milk was within the range of 4.1 to 4.5 acid degree value as determined by the modified Frankel and Tarassuk method. AA

- 2732 PILLAY (VT), MYHR (AN), GRAY (JI) and BIGGS (DA). Lipolysis in Milk. II. Effect of milking systems. *J. Dairy Sci.* 63(8); 1980; 1219-23

- 2733 SPICHER (G) and RABE (E). Influence of the temperature on the development of acetate and lactate by sour dough bacteria. *Getreide-Mehl Brot.* 34(3); 1980; 65-7 (German)

The influence of the temperature on the formation of acetate and lactate by heterofermentative sour dough bacteria was studied. The tested sour dough bacteria form lactic and acetic acid in different measure. Within the temperature region of 20 to 35 C the quantity of acetate, formed after 24 hours, proved to be much more constant than the quantity of lactate. The lactate to be detected occurs, predominantly, in the L-form. The ratio of D- to L- lactate is however, influenced by the temperature to a varying extent in the various sour dough bacteria. By virtue of the findings, the present knowledge on the influence of the conditions of sour dough on the formation of lactic and acetic acid or on the resulting fermentation quotient can be valid only for the population of sour dough bacteria in a starter or pure culture. KMD

- 2734 DZIUBA (J). The share of functional casein groups in the formation of a complex with β -lactoglobulin. *Acta Aliment. Pol.* 5(2); 1979; 97-114

- 2735 SOMKUTI (GA) and STEINBERG (DH). Adaptability of *Streptococcus thermophilus* to lactose, glucose and galactose. *J. Food Prot.* 42(11); 1979; 885-7

- 2736 SCHEYBAL (A), GABRIO (T), KIRST (E), SCHMIDT (KD) and NEUBERT (S). On the contamination of milk after dug redisinfection with iodophores. *Nahrung*. 24(6); 1980; 563-7 (German)
- 2737 WAL (J-M), PELERAN (J-C) and BORIES (GF). High performance liquid chromatographic determination of chloramphenicol in milk. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 1044-8
- 2738 HARPSTER (CP) and KATZ (SE). Improved microbiological procedure for determining erythromycin in milk and some milk products. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 1144-8
- 2739 COHEN (H) and WAKEFORD (B). High pressure liquid chromatographic determination of Vitamin D₃ in instant nonfat dried milk. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 1163-7
 Vitamin D₃ was determined in commercially fortified instant nonfat dried milk by using normal phase high pressure liquid chromatography (HPLC). The sample was extracted with dichloromethane with sodium phosphate tribasic solution and cleaned up by using a Sep-Pak silica cartridge and then a micro-particulate column containing 10 μ m Partisil-10 PAC packing material. The final analysis was performed by using a normal phase HPLC system with a 10 μ m LiChrosorb NH₂ column. Recovery of vitamin D₃ at levels as low as 1000 IU/kg was 97.7% with a standard deviation of 3.9%. AA
- 2740 TUINSTRA (LGMT), TRAAG (WA) and KEUKENS (HJ). Quantitative determination of individual chlorinated biphenyls in milk fat by splitless glass capillary gas chromatography. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 952-8
 A method is described for determining individual polychlorinated biphenyls (PCBs) in milkfat at the ppb level. Extraction and major cleanup are done simultaneously by saponification of the milkfat. After final cleanup on basic alumina, the concentrated extract is injected under splitless conditions on a capillary column coated with CP-Sil 7 stationary phase. The recovery of several individual PCBs from milkfat at a level of 25 ppb is better than 80%. The reproducibility for duplicates analyzed on several days showed standard deviations from 0.2 to 0.8 ppb for 19 individual chlorinated biphenyls. Some preliminary results for 165 samples of milkfat are reported. AA
- 2741 KRUK (A). Relationship between casein hydration degree and thermal stability of milk. *Acta Aliment. Pol.* 5(2); 1979; 147-56
 Essential positive correlation was found to exist between casein hydration degree and the thermal stability of milk. The maximum values of hydration and stability occur within the narrow pH range between 6.60 and 6.65 and at the ionic calcium content of 10-11 mg%. AA
- 2742 KISZA (J), SWITKA (J) and ZBIK (H). Changes in milk proteins in the process of heating them in a dry state with lactose and during the storage of the milk powder. *Acta Aliment. Pol.* 5(2); 1979; 139-45
 The authors present the results of investigations into the effect of the heating parameters and storage conditions on changes in selected milk proteins. The level of available lysine, the reducing capacity of "protein", changes in protein molecular weight and in casein sensitivity to calcium ions, were analysed. AA
- 2743 FRANCIS LANG. Unusual cultured milk product developments. *Milk Ind.* 82(12); 1980; 22-4
 Villi, koumiss, kefir, matsun and acidophilous products like yakult,

dough and leben have been covered. KAR

KHOA

- 2744 GYANENDRA KUMAR and SRINIVASAN (MR). Identification and estimation of some volatile carbonyls in three types of khoa by GLC. *J. Food Sci. Technol. (India)* 18(4); 1981; 157-8

Steam volatile carbonyls from (i) cow milk khoa, (ii) buffalo milk khoa and (iii) commercial khoa were separated and estimated by gas liquid chromatography. Of the 9 identified carbonyls, pentan-2-one was the major component comprising of 11.67% in (i), and 7.15% in (ii), while heptan-2-one was predominant in (iii) comprising 42.15%. The unidentified carbonyls accounted for 68.46% in (i) 73.33% in (ii) and 65.23% in (iii). KAR

YOGURT

- 2745 ROSENTHAL (I), JUVEN (BJ), GORDIN (S) and JUBRAN (N). Characteristics of concentrated yogurt (Labneh) produced in Israel. *J. Dairy Sci.* 63(11); 1980; 1826-8

Yogurt (Labneh) is a home made yogurt covered with oil and has been found ideally suited for hot climates. BSN

WHEY

- 2746 POZNANSKI (S), SMIETANA (Z), JAKUBOWSKI (J) and RYMASZEWSKI (J). Casein and whey protein interaction and its technological applicability. *Acta Aliment. Pol.* 5(2); 1979; 125-37

The authors have studied the effect of an addition of calcium chloride to milk prior to its pasteurization on the molecular weight of proteins, their electrophoretic mobility, hydration of casein micelles, titration curves of isolated proteins and the coagulation of milk by rennet. The addition of calcium chloride enabled to increase the yield of hard and cottage cheeses. The products obtained contained protein of a higher biological value. AA

- 2747 HILLIER (RM), LYSTER (RLJ) and CHEESEMAN (GC). Gelation of reconstituted whey powders by heat. *J. Sci. Food Agric.* 31(11); 1980; 1152-7

Whey protein preparations isolated from whey form stable gels when their aqueous solutions are heated at 80 C. They dissolve if a -SH reagent is added after heating. Opaque gels are formed from powders containing relatively large amounts of total -SH. Gels form faster on heating in N₂ instead of air. Gels form more slowly at alkaline pH. KAR

CHEESE

- 2748 SMIETANA (Z). A special modification of milk powder to be used for cheese manufacture. *Acta Aliment. Pol.* 5(2); 1979; 117-24

As a result of the addition of calcium chloride to milk prior to short time high temperature pasteurization (HTST), a milk powder having properties close to milk powder produced from mildly pasteurized milk was obtained. The characteristics of the powder obtained showed its applicability for cheese manufacture. AA

- 2749 OBREtenova (M), DIMITROV (D) and OBREtenov (T-ZV). Use of microbial enzyme preparations in cheese production. Part VI. Study of the volatile fatty acids of white brined-ripened cheeses made from cow's milk by means of the bacterial preparation "Meseyletin 11-11". *Nahrung*. 24(6); 1980; 519-23 (German)
- White brined-ripened cheese has been made under production conditions from cow's milk using the bacterial enzyme preparation "Meseutelin 11-11" and the Bulgarian cheese rennet "pharmachin". The volatile fatty acids obtained by steam distillation and diethyl ether extraction were analysed by gas chromatography. Their changes during the ripening process were followed over a period of 90 days. New findings concerning the ripeness index K are reported. AA
- 2750 HEGAZI (Z) and ABO-ELNAGA (I-G). The microbial flora of Awshari cheese with special reference to *Lactobacilli*. *Nahrung*. 24(6); 1980; 551-61
- Thirty seven samples of Awshari cheese and 13 of Biza were examined microbiologically. *Lactobacilli* were predominant in almost all samples except in one which, however, contained, in addition *Streptococci* (5%). Out of 98 *Lactobacilli* isolated from 10 samples, 55 were identified as beta bacteria and the rest as *Streptobacteria*. *Penicillia* and yeasts occurred in all the samples of Biza, with *Saccharomyces lactis* being encountered in 5 out of 6 samples examined for the type of yeasts. KMD

MEAT AND POULTRY

- 2751 QUITZ (M). New meat processing plant at Cottbus. *Fleisch*. 33(3); 1979; 49-51 (German)
- 2752 ROBACH (MC), DIFATE (VG), ADAM (K) and KIER (LD). Evaluation of the mutagenicity of sorbic acid - sodium nitrite reaction products produced in bacon-curing brines. *Food Cosmet. Toxicol.* 18(3); 1980; 237-40
- Typical bacon-curing brines containing potassium sorbate (2600 ppm), sodium nitrite (40-4000 ppm) and sodium ascorbate (550-55,000 ppm) were reacted under conditions simulating gastric fluid or the curing or cooking of bacon. Ames Salmonella assays were conducted on the reaction solutions as well as on their ether extracts. All sorbate-nitrite solutions and most ether extracts were negative in this assay. A positive response was detected in the high temperature sample, but retesting of this sample indicated that the positive response was due to an active compound in the ether used as the extraction solvent. AA
- 2753 ROMMINGER (G) and HUHN (H). About the problem of imparting a red colour to meat. Part I. Present status of knowledge. *Fleisch*. 33(3); 1979; 57-9 (German)
- Despite the continued practice of conversion of red colour of meat and meat products with the help of nitrates and nitrites, there are still no clear explanations on the reaction mechanism and the kinetics of the nitrosopigment formation. The clarification of this problem is necessary not only from toxicological point of view but also for the purpose of controlling the process. The present status of knowledge of the effect of nitrite on the meat pigments is reported and a reaction scheme is postulated. KMD
- 2754 DENNIS (MJ), MASSEY (RC) and McWEENY (DJ). The transnitrosation of N-methylaniline by a protein-bound nitrite model system in relation to N-nitrosamine formation in cured meats. *J. Sci. Food Agric.* 31(11); 1980; 1195-1200

The reactions of sodium nitrite, S-nitrosocysteine hydrochloride, S-nitrosoglutathione and a 'protein-bound nitrite' model system with N-methylaniline at pH 5.5 and 37 C have been compared. The results show that the rate of nitrosamine formation from sodium nitrite and S-nitrosocysteine is greater than that from the model system although the latter depends upon the local concentration of nitrosothiol groups on the matrix. Transnitrosation by S-nitrosoglutathione is considerably slower than the other reactions. The implications of the results with respect to nitrosamine formation in cured meat are discussed. AA

- 2755 IGENE (JO), PEARSON (AM), DUGAR (LR) Jr. and PRICE (JF). Role of triglycerides and phospholipids on development of rancidity in model meat system during frozen storage. *Food Chem.* 5(4); 1980; 263-76

The effect of triglycerides, phospholipids and total lipids on rancidity development during frozen storage at -18 C for 8 months was studied using lipid - free muscle fibres. Oxidation of phospholipids started first followed by the triglycerides. It was concluded that both triglycerides and phospholipids contribute to development of rancidity, although phospholipids make the greatest contribution. KAR

- 2756 SKURRAY (GR) and PERRYMAN (DL). The effects of alkaline hydrogen peroxide treatment on the nutritional value of tripe. *Meat Sci.* 4(4); 1980; 313-8

Samples of tripe obtained after commercial processing with alkaline hydrogen peroxide were compared with raw tripe for nutritional quality. A large number (108) of commercial tripe samples were found to vary markedly in their protein content from 8.4 to 19.3%. The moisture content was negatively correlated with the pH of the tripe samples. However, the amino acid analyses and rat bioassays indicated that the nutritional value of the protein was not significantly decreased by the processing. Oxidation of sulphur amino acids and formation of lysino-alanine were not evident. Thiamine was completely destroyed by the processing. AA

- 2757 GNAUSCH (W). Keeping the air clean in the environs of flaying houses. *Fleisch.* 33(3); 1979; 45-6 (German)

- 2758 DABASH (AS), GIBRIEL (AY), HUSSEIN (MF) and EL-DASHLOUTY (AA). Chemical and physical properties of Egyptian beef and pork. *Nahrung.* 24(6); 1980; 513-8

Beef and beef fat tissues showed relatively higher percentages of moisture, protein and ash content but lower amounts of fat and dry matter than pork and lard. Fresh beef showed higher levels of total solid nitrogen, total volatile nitrogen, and amino nitrogen contents, as compared with pork which showed higher pH and thiobarbituric acid values. Pork had a higher thiamine content than beef. Specific gravity and colour intensity were higher in beef than in pork. The water holding capacity and tenderness were markedly higher in pork than in beef. AA

BEEF

- 2759 HOOD (DE). Factors affecting the rate of metmyoglobin accumulation in pre-packaged beef. *Meat Sci.* 4(4); 1980; 247-65

Factors affecting the rate of discolouration of pre-packaged beef have been compared quantitatively in a number of experimental animals. Inter-muscular variability is the most important single factor and ranges from the stable *M. longissimus dorsi* to the unstable *M. psoas major*, the degree of discolouration of the latter muscle being almost eight times greater after 96 hours

storage at 0 C. Among other intrinsic factors studied, age post mortem has a slight accelerating effect while pH, within the narrow range exhibited by experimental animals, has no effect. Inter-animal variability also has an effect, but only a slight one. Of the extrinsic factors studied, temperature is most important from a practical standpoint, the degree of discolouration after 96 hours storage at 10 C ranging from two to five times that at 0 C, depending on the muscle. Light produces only a minor accelerating effect but UV produces serious discolouration in all muscles within hours, even at 0 C. Slight differences exist between packaging films but these are not commercially significant. AA

- 2760 MASCHERONI (RH) and CALVELO (A). Relationship between heat transfer parameters and the characteristic damage variables for the freezing of beef. *Meat Sci.* 4(4); 1980; 267-85

One of the most suitable parameters for relating the freezing rate to the volume of drip produced during the thawing of meat is the characteristic time, defined as the time necessary to reduce the temperature of the sample from -1.1 C (initial freezing point in beef) to -7C (80% of the water frozen). However, as the freezing of beef in factories takes place with important temperature gradients, distributions of these characteristic times must be expected along the pieces of frozen meat. In order to relate these characteristic time distributions to heat transfer parameters under industrial freezing conditions, a mathematical model which simulates the freezing of beef is developed in this paper. The model establishes the heat transfer equations with simultaneous change of phase, taking into account the dependence of the thermal properties with the ice content and considering the anisotropy of the thermal conductivity according to the direction of the fibres. Boundary conditions include the possibility of thermal resistances in the refrigerated interphase. The model developed was compared with laboratory experiments performed under factory freezing conditions and showed a satisfactory agreement between theory and experiment. AA

- 2761 ENDER (K) and REICHARDT (W). On the determination of intramuscular fat in beef by means of extraction with chloroform method. *Nahrung.* 24(6); 1980; 493-8 (German)

Intramuscular fat in beef is determined by means of extraction with a mixture of chloroform/methanol (in the volume ratio 3:1). In this extraction, one found higher lipid values than those obtained with extraction with diethyl ether. The fat values obtained for the ether extract were closely correlated with those found for the chloroform-methanol extract ($r = 0.925$). The correlation was less close ($r = 0.660$) when water was added to the chloroform-methanol extract. Apart from its high precision, the chloroform-methanol extraction has the special advantage that it requires relatively simple safety measures, and that it has a lower energy requirement. KMD

- 2762 TARRANT (PV) and SHERINGTON (J). An investigation of ultimate pH in the muscles of commercial beef carcasses. *Meat Sci.* 4(4); 1980; 287-97

Ultimate pH values were recorded in the carcasses of steers and heifers at a beef slaughtering plant over a period of 3 years. The incidence of carcasses with a $pH_u \geq 6.0$ in the LD-a value usually associated with 'dark cutting' in beef- was 3.2%. A pronounced seasonal effect was observed with the incidence rising from 1.2% for the period February to August to 5.2% for the period September to January, inclusive. An examination of thirteen muscles showed that increases in pH_u above normal values occurred most frequently in the LD and four large muscles of the hindquarter and were much less frequently observed in the eight other hind- and forequarter muscles examined. In the

carcasses of young bulls, also slaughtered under commercial conditions, high pH_u values were predominantly associated with the same muscles as in steers and heifers. However, when experimental cattle were given adrenaline to induce high pH_u values, this treatment resulted in a general increase in pH_u in all the muscles examined. The different pattern of pH_u elevation in the adrenaline-treated and commercial carcasses suggests different physiological mechanisms in the two cases. AA

- 2763 HSIEH (YPC), CORNFORTH (DP), PEARSON (AM) and HOOPER (GR). Ultrastructural changes in pre- and post-rigor beef muscle caused by conventional and microwave cookery. *Meat Sci.* 4(4); 1980; 299-31

Examination of cooked pre-rigor muscle by TEM (transmission electron microscopy) and SEM (scanning electron microscopy) revealed that all cookery methods resulted in the development of supercontraction bands alternating with areas showing tissue fragmentation and tearing. Microwave cookery produced smaller and less dense supercontraction nodes in pre-rigor muscle with less tearing and fragmentation but more fibre separation. Although cold-shortened pre-rigor muscle cooked by all methods also exhibited supercontraction bands with some tearing and fragmentation in adjacent sarcomeres the samples cooked by microwaves showed a more uniform repeating pattern of small stretched areas alternating with dense contracted areas. Cooking of muscle in full rigor resulted in myofibrillar protein coagulation and shrinkage but supercontraction nodes were absent. Cold-shortened bicarbonate treated muscle was relatively intact after cooking, exhibiting fusion of the myofibrils and an absence of intermyofibrillar spaces. Results are discussed in relation to possible effects upon tenderness. AA

SHEEP

- 2764 BLACKMAN (GL), HO (AC), JOZSA (A) and KELLY (JD). High performance liquid chromatographic determination of phenothiazine residues in sheep tissues. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 988-91

- 2765 DAVEY (CL) and GARNETT (KJ). Rapid freezing, frozen storage and the tenderness of lamb. *Meat Sci.* 4(4); 1980; 988-91

Cold-shortening in pre-rigor lamb can be prevented by freezing carcasses very rapidly in less than four hours. Thaw-shortening can also be prevented by storing the carcasses for a period (>10 days) in the frozen state (-12 C). By this simple combination of rapid freezing and frozen storage, the hazard of toughness development from cold- and thaw-shortenings is avoided. AA

RABBIT

- 2766 ANON. More rabbit meat for the customers. Better skins for processing (round-table talk). *Fleisch.* 33(3); 1979; 43-5 (German)

The problems in the rabbit meat industry have been discussed. The producers are of the view that rabbit meat production and obtaining skins are a complex task. It is a question of increased production of rabbit meat and a good quality of the skin. Transportation, storage, marketing of meat are the other problems, that have been discussed. KMD

POULTRY

- 2767 ZOPHEL (KH). Internal means of rationalization in slaughtering houses for poultry. *Fleisch*. 33(3); 1979; 52-4 (German)
- 2768 ROBACH (MC). Extension of shelf-life of fresh, whole broilers, using a potassium sorbate dip. *J. Food Prot.* 42(11); 1979; 855-7
 The shelf life of fresh, whole broilers was extended by dipping freshly chilled carcasses into a 5% (w/v) solution of potassium sorbate for 30 sec. On storage, control birds dipped in water only, showed spoilage after 10 days, while birds dipped in sorbate showed spoilage only after 19 days. KMD
- 2769 KARGI (F), SHULER (ML), VASHON (R), SEELEY (HW) Jr., HENRY (A) and AUSTIC (RE). Continuous aerobic conversion of poultry waste into single-cell protein using a single reactor: Kinetic analysis and determination of optimal conditions. *Biotechnol. Bioeng.* 22(8); 1980; 1567-600

SEAFOODS

- 2770 TINSLEY (IJ) and LOWRY (RR). Bromine content of lipids of marine organisms. *J. Am. Oil. Chem. Soc.* 57(1); 1980; 31-3
 The bromine compounds present in the lipid fraction of several marine organisms (from the North Pacific Ocean) were estimated with a view to (a) documenting the distribution of pollutants, and (b) discovering some naturally occurring compound of pharmaceutical significance. The bromine content of the lipids ranged from 10 to several hundred $\mu\text{g/g}$. Most of the bromine was associated with fatty acids in chromatographic separations, but several different brominated compounds, including brominated acids, were also present. KMD

FISH

- 2771 TULSNER (M) and EL-BEDAWAY (F). Decomposition of collagen by heat in fish processing. *Lebensmittel-Industrie*. 27(4); 1980; 175-9
 The article deals with the results of investigation of determining of collagen content in cod fish (*Gadus callarias*), mackerel (*Scomber scomber*) and herring (*Clupea harengus*) according to the method of Stegemann and Stalder and also on the decomposition of collagen by heat during processing. It was stated that the addition of 2.5-5 per cent of common salt decreases the decomposition of collagen, whereas the decrease of pH value accelerates the liquefaction of the collagen. AA
- 2772 DAVIDOVICH (LA), SOULE (CL) and LUPIN (HM). Kinetics of fish meat oxidation. *J. Am. Oil Chem. Soc.* 57(1); 1980; 43-7

TARAMO

- 2773 DZINLESKI (B), BELICOVSKI (S) and ARIZANOV (T). Some quality properties of taramo salad. *Technol. Mesa*. 21(3); 1980; 74-8

KRILL

- 2774 KOLAKOWSKI (E), GAJOWIECKI (L), SZYBOWICZ (Z) and CHODORSKA (T). Application of partial autoproteolysis to extraction of protein from Antarctic krill (*Euphausia superba*). Part I. Effect of pH on protein extraction intensity. Part II. Influence of temperature on protein extraction intensity. *Nahrung*. 24(6); 1980; 499-506; 507-12

SHRIMP

- 2775 PETERSON (EK). Comparative study of procedures for quantification of *Vibrio parahaemolyticus* in seafoods. *J. Food Prot.* 42(11); 1979; 852-4

PROTEIN FOODS

- 2776 CONSTANTINIDES (A) and ADU-AMANKWA (B). Enzymatic modification of vegetable protein : Mechanism, kinetics, and production of soluble and partially soluble protein in a batch reactor. *Biotechnol. Bioeng.* 22(8); 1980; 1543-65

FRUIT JUICES AND BEVERAGES

FRUIT JUICES

- 2777 GOLEBIEWSKI (T), BOROWIEC (W) and NIEMIEC (B). Comparison of different methods of determining ethanol in fruit juices. *Lebensmittel-Industrie*. 27(4); 1980; 171-4

Following methods are used to determine ethanol content in fruit juices, a) dichromate-iodometric method, b) dichromate-iodometric method, modified by Sobczak c) pycnometric method (using vacuum pycnometers). The methods are compared with regard to accuracy and deviation. Results show that the most precise results can be obtained only with the dichromate - iodometric method. This method, as modified by Sobczak, can be used in normal laboratory practice because of its simplicity and speed. The pycnometric method also may be used in place of the modified dichromate-iodometric method. KMD

PINEAPPLE

- 2778 GOWRAMMA (RV), MAHADEVIAH (M), EIPESON (WE), SASTRY (LVL) and PATWARDHAN (MV). Corrosion of tinplate with pineapple juice. *J. Food Sci. Technol. (India)* 18(4); 1981; 159

Influence of different fractions (amino acid, (AA), sugar (S), sugar + organic acid and organic acid (OA)) of pineapple juice on corrosion of tinplate have been assessed at regular intervals of storage extending for 12 months. Anion fraction consisting of OA corroded maximum. Corrosion was minimum with AA. Fraction S and AA along with OA reduced the corrosion to minimum. KAR

APPLE

- 2779 BRACKETT (RE) and MARTH (EH). Patulin in apple juice from roadside stands in Wisconsin. *J. Food Prot.* 42(11); 1979; 862-3
- 2780 MOLLER (TE) and JOSEFSSON (E). Rapid high pressure liquid chromatography of patulin in apple juice. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 1055-6
- 2781 BRACKETT (RE) and MARTH (EH). Ascorbic acid and ascorbate cause disappearance of patulin from buffer solutions and apple juice. *J. Food Prot.* 42(11); 1979; 864-6

PHALSA

- 2782 KHURDIYA (DS) and ANAND (JC). Effect of storage temperatures on the quality of phalsa beverage. *J. Food Sci. Technol. (India)* 18(4); 1981; 160-1
- A ready-to-serve beverage containing 35% juice from phalsa (*Grewia subinaequalis* L.) was filled hot (85 C) into glass bottles and stored at 3 C, 20 C and 31-36 C for 100 days and the quality assessed. Beverage colour was best retained at 3 C followed by 20 C and 31-36 C. The beverage could be stored well for 100 days, at 3 C but at other temperature more so at 31-36 C. the acceptability goes down. KAR

SOFT DRINK

- 2783 VESELY (Z), DAVIDKOVA (E) and PRUDEL (M). Determination of α -L-aspartyl-L-phenylalanine methylester hydrochloride in soft drinks. *Nahrung.* 24(6); 1980; 525-8
- Analytical evaluation of the artificial sweetener USAL (α -L-aspartyl-L-phenylalanine methylester hydrochloride) was carried out using a modified technique of amino acid analysis. The determination was performed using a functionally simplified semiautomatic amino acid analyser. The device was constructed using the accessories of the automatic amino acid analyser AAA 888 (Mikrotechna Praha). AA

COCOA

- 2784 HORUBALOWA (A) and TOMKIEWICZ (W). Changes in cocoa powder during storage. *Acta Aliment. Pol.* 5(3); 1979; 239-50
- Chemical, physical and sensoric changes in cocoa powder, stored for 5 months under various temperature and humidity conditions, were investigated. A decrease of the quality of cocoa powder, expressed by a growth of total acidity, of the acid number of fat, of the peroxide value and sedimentation in water and milk, as well as by a drop of the sensoric value due to the loss of aroma and the brightness of colour, was observed. AA

ALCOHOLIC BEVERAGE

- 2785 MARK (FG) and VAUGEN (TE). Determination of proof of alcoholic beverages using oscillating U-tube density meter. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 970-2

WINE

- 2786 LIN (JY) and TAI (MW). Mutagenicity of chinese wine treated with nitrite. *Food Cosmet. Toxicol.* 18(3); 1980; 241-3
 Mutagens were formed in seven out of 12 brands of chinese wine tested after treatment with nitrite at pH 3. Most of the nondistilled wines were found to contain the precursors of mutagens while the distilled wines did not. The majority of chinese wine is nondistilled and this, coupled with the over use of sodium nitrite in food processing in China, could be a cause of the high incidence of several types of cancer among chinese people. AA

OILS AND FATS

- 2787 FARLEY (DR) and HOWLAND(DR). The natural variation of the pulegone content in various oils of peppermint. *J. Sci. Food Agric.* 31(11); 1980; 1143-51
 The pulegone content in American peppermint oil was shown to be directly related to harvest date. KAR
- 2788 SELKE (E), ROHWEDDER (WK) and DUTTON (HJ). Volatile components from trilinolein heated in air. *J. Am. Oil. Chem. Soc.* 57(1); 1980; 25-30
 Pure trilinolein and mixtures of trilinolein-tristearin, trilinolein-triolein, and trilinolein-triolein-tristearin were heated at 192 C in air. Volatiles were collected, separated, and identified by GC-MS. Volatiles produced by heating a mixture of trilinolein and triolein were those that could be ascribed to one or other of these triglycerides. But on heating mixtures containing tristearin, no volatiles that could be related to the oxidized triglyceride were observed. Thus, tristearin acts mainly as a diluting solvent. KMD
- 2789 BERTH (G), ANGER (H) and LEXOW (D). On the determination of the molecular weights of pectins by means of membrane osmometry in aqueous solutions. *Nahrung.* 24(6); 1980; 529-34 (German)
 The molecular weights of mechanolytically degraded pectins with a degree of esterification of approximately 70% and their completely esterified derivatives were determined by membrane osmometry. Whereas the results obtained with the completely esterified samples (prepared by polymer-analogous reaction with diazomethane) were not influenced by composition of the solvent, the results for partially esterified preparations depended upon the salt content of the solutions. In 0.5 M sodium chloride/0.005 M sodium oxalate, the values for partially and completely esterified pectins were consistent. From these findings, conclusions are drawn as to the application of this method in pectin characterization. AA
- 2790 WULFF (CA), DUTHIE (AH) and WULFF (S). Functional analysis of gas chromatographic data for C-4 through C-18:2 fatty acids. *J. Am. Oil Chem. Soc.* 57(1); 1980; 34-8
- 2791 HILL (EG) and HOLMAN (RT). Effect of dietary protein level upon essential fatty acid (EFA) deficiency. *J. Nutr.* 110(5); 1980; 1057-60
 It was found as measured by the biochemical criteria that protein deficiency may increase the EFA requirement. KAR

SPICES AND CONDIMENTS

GARLIC

- 2792 CHAND (MLW) and JOHNSON (MA). Effect of garlic on carbohydrate metabolism and lipid synthesis in rats. *J. Nutr.* 110(5); 1980; 931-6
 The results showed that garlic reduces lipid synthesis and influences glycogen metabolism in the liver of rats. The hypoglycemic effect of garlic is associated with the increase of insulin level. KAR

GINGER

- 2793 TRUCKSESS (MW) and STOLOFF (L). Thin layer chromatographic determination of aflatoxins in dry ginger root and ginger oleoresin. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 1052-4

MUSTARD

- 2794 CHAHAL (AS). Seed-borne infection of *Alternaria brassicae* in Indian mustard and its elimination during storage. *Curr. Sci.* 50(14); 1981; 621-3
 Mustard seeds suffer severe discolouration and shrivelling due to survival of *A. brassicae* beneath the testa. Considerable loss of weight and oil content occurs in shrivelled seeds. Discolouration without shrivelling does not interfere much in the oil content though it reduces grain weight. Rape and mustard seeds stored for 5 months (from mid-April to mid-September) at room temperature (29-38.5 C) or at natural conditions of storage in Punjab (India) became free of *A. brassicae* thereby showing that storage eliminates the infection by *A. brassicae*. MVG

SENSORY EVALUATION

Nil

FOOD STORAGE

- 2795 VILLOTA (R), SAGUY (I) and KAREL (M). Storage stability of dehydrated food-evaluation of literature data. *J. Food Qual.* 3(3); 1980; 123-212
 The review covers the effect of various factors like oxygen, moisture, temperature and light on storage stability; effects of storage on organoleptic properties and including the flavour, colour, rehydration and texture; and the nutritional value and areas where more information regarding the stability of important food items is needed. KAR

INFESTATION CONTROL AND PESTICIDES

- 2796 GHODAKE (RD) and JHA (D). Pesticide use decisions in agriculture. A note. *Indian J. Agric. Econ.* 36(2); 1981; 35-44

The application of integrated analysis of pesticide use have been demonstrated under certain/uncertain situations of pest-crop-environment, using as an example the problem of stem-borer infestation in rice. A single equation has been developed to estimate logically consistent pesticide responses, corresponding to different levels of infestation. KMD

- 2797 SUCKOW (P) and MEUSER (F). Improving of "clean up" for the determination of pesticide residues. *Getreide-Mehl Brot.* 34(3); 1980; 60-5 (German)

A method was devised to determine lindane, and PP-DDT in cereals and cereal products, wherein the "clean up" is simplified and shortened. The following steps are involved: cutting material into pieces; extraction of the sample; taking an aliquot portion of extract direct from the extraction flask, with the help of a syringe; charging on the column for gel chromatography; concentration of the collected insecticide from GC fraction to a definite volume; gas chromatographic determination and evaluation. KMD

- 2798 SCHULTE (E) and ACKER (L). Capillary gas chromatographic separation of residues of chlorohydrocarbons in foods and identification of mirex in human fat tissue. *Nahrung.* 24(6); 1980; 577-83 (German)

The residue analysis of organochloro-insecticides could be improved by using glass capillary columns. The advantages of capillary gas chromatography are: separation of complex mixtures, improved reliability, simultaneous determination of by-components and increased sensitivity. Mass spectrometer is used to identify mirex in human fat tissue. About 0.5-5 µg/kg of mirex was found in 25 human fat samples, obtained from 5 cities of the Federal Republic of Germany. KMD

- 2799 KAWANO (Y) and CHANG (W). Spectrophotometric determination of Rozol in paraffinized formulations. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 996-8

- 2800 KARR (JJ). Gas-liquid chromatographic method for the analysis of microencapsulated ethyl parathion and methyl parathion insecticides: collaborative study. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 999-1002

- 2801 ARGAUER (RJ). Extent of microencapsulation in pesticide formulations of diazinon, methyl parathion, and ethyl parathion. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 1003-6

- 2802 KRAUSE (RT). Multiresidue method for determining N-methylcarbamate insecticides in crops, using high performance liquid chromatography. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 1114-24

- 2803 CLARK (ER) and QAZI (IA). Further improvement of the modified spectrophotometric method for the determination of malathion. *Analyst.* 105(1251); 1980; 564-7

The main advantages in this method are, the reduction in the number of reagents required, avoidance of interferences, stability of the colour, an alkaline hydrolysis of malathion and complexing with bismuth phosphate. Since bismuth complex absorbance lies in UV region, a sensitive spectrophotometer

has to be used. Final modification involves the liquid exchange reaction in which the bismuth - dimethyldithiophosphate complex is transformed quantitatively into the bismuth dithizone complex which can be read in the visible region (495 nm). BSN

- 2804 WINTERLIN (W), WHITEHEAD (E) and MOURER (C). Gas-liquid chromatographic determination of S-((5-Methoxy-2-oxo-1,3,4-thiadiazol-3(2H)-yl)-methyl)),0,0-dimethyl phosphorodithioate (supracide) and its monoxone metabolite in safflower seed, meal and oil. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 1105-8
- A gas-liquid chromatographic (GLC) method for determining residues of the insecticide-acaricide supracide (S-(5-methoxy-2-oxo,1,3,4-thiadiazol-3(2H)-yl)-methyl)0,0-dimethyl phosphorodithioate) and its monoxone metabolite in safflower seed, meal, and oil is presented. Supracide and its monoxone metabolite are separated by partitioning with acetonitrile-sodium sulfate and petroleum ether. The petroleum ether fraction containing the Supracide is extracted with acetonitrile and further cleaned up on a Florisil column before determination by GLC flame photometric detection (FPD). The monoxone metabolite is partitioned from the acetonitrile-sodium sulfate fraction with chloroform and cleaned up on a Florisil column before GLC/FPD. Average Supracide recoveries were 86, 82.5, and 92%, and average Supracide monoxone recoveries were 85.7, 81.5, and 89%, in seed, meal, and oil, respectively. The limit of detection was 0.005 ppm for both compounds on all tissues analyzed. AA

BIOCHEMISTRY AND NUTRITION

- 2805 WRIGHT (RG), MILWARD (RC) and COLES (BA). Rapid protein analysis by low-resolution pulsed NMR. *Food Technol.* 34(12); 1980; 47-52
- Working of the Newport P-100 Protein Analyser is described. KAR
- 2806 BEDNARSKI (W) and LEMAN (J). Detoxification and parallel modification of some functional properties of unconventional protein by enzymatic treatment. *Acta Aliment. Pol.* 5(2); 1979; 165-81
- Two-stage enzymatic refining of yeast and field bean proteins has been carried out. Protein hydrolysis was conducted using pepsin or papain, followed by protein resynthesis with - chymotrypsin. The possibility of modification of physico-chemical properties and improvement of biological value of proteins by combining field bean or yeast protein hydrolysates with whey protein hydrolysates or blood plasma protein hydrolysates before enzymatic resynthesis, has been shown. AA
- 2807 THEILE (H). Dietetic treatment of enzymopathies of protein metabolism. *Ernährungsforschung.* 24(4); 1979; 120-3
- A method for the treatment of phenylketonuria by means of Berlophen - a composition containing phenylalanine-free casein hydrolysate (446.0g), DL-tryptophane (13.5 g), DL-methionine (13.5 g), L-tyrosine (27.0 g), and a minimum protein content of 10% - has been described. KMD
- 2808 POKORNY (J) and DAVIDEK (I). Influence of inter-actions of proteins with oxidized lipids on nutrition and sensory value of food. *Acta Aliment. Pol.* 5(2); 1979; 87-95
- Hydroperoxides, carbonylic derivatives and various other lipid oxidation products react with proteins modifying their chemical, physical and technological properties. The digestibility and the biological value are decreased by destruction of some essential amino acids and by formation of insoluble com-

pounds; the sensory value is affected by reactions of volatile lipid oxidation products and by browning reactions. AA

- 2809 SELVENDRAN (RR) and DuPONT (MS). Simplified methods for the preparation and analysis of dietary fibre. *J. Sci. Food Agric.* 31(11); 1980; 1173-82
Modification of the enzymatic method for the isolation and analysis of milligram quantities of DF, which can be used for screening a range of food products is described. Disruption of product by ball-milling in aqueous ethanol, followed by gelatinisation are essential to give maximum enzyme accessibility. The method for the removal of starch involves treatment with either a mixture of human salivary α -amylase and pullulanase or amyloglucosidase. The neutral sugars released from the DF on IM H_2SO_4 or Saeman-hydrolysis were estimated by the alditol acetate procedure and a modified carbozole method has been used for the estimation of total uronic acid in the fibre. KAR
- 2810 LEVEILLE (GA). A nutrition scientist's view of food and nutrition education needs. *Food Technol.* 34(12); 1980; 56-7
Discusses about consumer education needs, consumer education programmes and training of professionals. KAR
- 2811 BROWN (G) and PELICAN (S). Nutrient-based approaches to nutrition education. *Food Technol.* 34(12); 1980; 62-3
- 2812 STILLINGS (BR). The food industry's responsibilities in food and nutrition education. *Food Technol.* 34(12); 1980; 64-7
- 2813 ANDRAE (W), BERGER (M) and MOLLMER (G). Comparison of technological variants of filling and preservation of baby food supplements. *Lebensmittel-Industrie.* 27(4); 1980; 165-9 (German)
Three methods are proposed for the filling and preservation of liquid baby food supplements, based on fruits and vegetables, that are meant to meet the vitamins and mineral requirements of infants. Cold filling followed by sterilisation; HTST heating followed by hot filling and HTST heating followed by cold filling and pasteurisation. Each process has its own disadvantages, but they can be eliminated by improving them technologically. The last method is the one that is most economical from the standpoint of energy consumption, and the saving in energy could well offset the cost of the extra ascorbic acid that has to be added in this case. KMD
- 2814 SPAHN (U) and PLENERT (W). Fundamentals of infant feeding. *Ernährungsforschung.* 24(4); 1979; 103-6 (German)
- 2815 HAENEL (H) and GRUTTE (FK). Breast feeding - an old-fashioned habit? *Ernährungsforschung.* 24(4); 1979; 98-103 (German)
- 2816 MOHR (M). Hints for the further improvement of toddler feeding. *Ernährungsforschung.* 24(4); 1979; 107-10 (German)
- 2817 WEINER (R) and HARTIG (W). Indications for tube-feeding in surgery. *Ernährungsforschung.* 24(4); 1979; 116-7 (German)
- 2818 COHEN (H) and LAPOINTE (M). Determination of low levels of vitamin D₃ in animal feeds, using sephadex LH-20 and normal phase high pressure liquid chromatography. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 1158-62
A procedure has been developed for the purification and quantification of vitamin D₃ at levels of 4000 down to 500 IU/kg from a variety of animal feeds.

The method involves initial extraction with dichloromethane followed by filtration through a Sep-Pak cartridge. The D₃ fraction from the Sep-Pak is further purified by using a 45 x 1.6 cm Sephadex LH-20 column followed by a Partisil-10 PAC cleanup column. Final analysis is performed by high pressure liquid chromatography (HPLC) using a LiChrosorb NH₂ 10 μ m column and a variable wavelength UV detector set at 264 nm. The detection response curve for a vitamin D₃ standard was linear over the range 5 to 100 ng, using both peak area and peak height measurements; the minimum detectable amount was 5 ng. The average percent recovery of vitamin D₃ in animal feeds was $94.16 \pm 5.2\%$. AA

- 2819 LEIN (DG), CAMPBELL (HM) and COHEN (H). High pressure liquid chromatographic determination of vitamin D₃ in mineral feed premixes. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 1149-52

A simple and rapid quantitative method is described for determining the presence and amount of vitamin D₃ (cholecalciferol) in mineral feed premixes by high pressure liquid chromatography. The samples were extracted with dichloromethane-pentane-methanol (46+46+8) after treatment with ammonium hydroxide, cleaned up by Silica Sep-pak, and analyzed by normal phase high pressure liquid chromatography; 10 μ m LiChrosorb NH₂ column, hexane-isopropanol (98+2) mobile phase, ultraviolet detection at 254 nm. Recoveries were better than 95% in the range 25,000-100,000 IU/kg. AA

- 2820 ERIKSEN (S). Rapid high performance liquid chromatographic method for determination of gelatin-coated supplemental vitamin E in feeds. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 1154-7

A rapid method is described for determining supplemental vitamin E in feeds by means of high performance liquid chromatography (HPLC) using isocratic elution with methanol-water. The sample is mixed with water and left on a water bath to dissolve the coating. The released vitamin E is extracted, the solvent is evaporated, and the sample is redissolved in methanol for injection. The method is applicable to gelatin-coated vitamin preparations. Standard deviations for 2 ranges of supplemented vitamin E, 10-50 ppm and 50-200 ppm, are 1.6 and 5.7, respectively. AA

- 2821 KNOLL (G). Obesity in childhood. *Ernährungsforschung*. 24(4); 1979; 114-6 (German)

TOXICOLOGY AND HYGIENE

- 2822 ABELSON (PH). New directions in toxicology. *Food Cosmet. Toxicol.* 18(3); 1980; 303-6

- 2823 SCHMID (K), SCHWEIZER (W), STAUBLI (W) and WAECHTER (F). Studies of the effect of 2-(2'-hydroxy-5'-methylphenyl) benzotriazole on rat liver. *Food Cosmet. Toxicol.* 18(3); 1980; 245-52

The repeated administration of ultraviolet absorber (2-(2'-hydroxy-5'-methylphenyl) benzotriazole) in a daily dose of 300 mg/kg to young adult male rats had no influence on their growth rate, but caused an increase in the relative liver weight. The activity of several mixed function oxidases remained unchanged. The activities of two microsomal enzymes, UDP glucuronosyltransferase and aminopyrine N-demethylase are stimulated by prolonged (28 day) treatment with UVA. KMD

- 2824 RUKMINI (C), PRASAD (JS) and RAO (K). Effects of feeding T-2 toxin to rats and monkeys. *Food Cosmet. Toxicol.* 18(3); 1980; 267-9

Apart from loss of fur, no abnormalities were seen in the rats fed mouldy sorghum containing T2-toxin and histopathological examination of the tissues revealed no significant abnormalities. Signs of toxicity were observed in all the monkeys given 1 mg T2-toxin/kg/day. The toxic effects were more pronounced in males than in females. All the male animals developed severe leucocytopenia and died between days 8 and 15 of treatment. The lungs of the dead animals showed grey hepatization. KMD

- 2825 ZABIELSKI (J) and FISZER (W). Radiometric determination of the degree of microbiological decontamination of working surfaces in food industries. *Acta Aliment. Pol.* 5(3); 1979; 287-99

Bacteria ^{32}P were used to determine cleanability of various surfaces used in food industries. Surfaces made of plastics, teflon in particular, had the highest cleanability level as compared with those of steel or aluminium. AA

- 2826 SEENAPPA (M) and KEMPTON (AG). A simple key for the identification of *Bacillus* species common in foods. *J. Food Sci. Technol. (India)* 18(4); 1981; 131-3

An artificial key based on the utilization of citrate salts for the classification and identification of *Bacillus* species is given. The key is specially designed for rapid confirmation of *B. cereus* isolated on selective media. Method for identification of citrate variable species or strains is also given. KAR

- 2827 FAZEL-MADJLESSI (J) and BAILEY (JE). Analysis of fermentation processes using flow microfluorometry: Amylase and protease activities in *Bacillus subtilis* batch cultures. *Biotechnol. Bioeng.* 22(8); 1980; 1657-69

- 2828 HOLMBERG (A), SIEVANEN (R) and CARLBERG (G). Fermentation of *Bacillus thuringiensis* for exotoxin production: Process analysis study. *Biotechnol. Bioeng.* 22(8); 1980; 1707-24

- 2829 KUNZ (B) and SINGER (G). Aspects of the characterization of the growth behaviour of *Brevibacterium linens* in emerged culture. *Nahrung.* 24(6); 1980; 535-41 (German)

The mode of distribution of the inoculum on the surface of the culture medium, the amount of inoculum per unit area and the concentration of the inoculum exert considerable effects on the obtainable germ density of the suspensions of *Brevibacterium linens* in emerged culture. The obtainable germ density is connected with the amount of inoculum by a quadratic function and the relationship between the obtainable germ density and the concentration of the inoculum is expressed in the form of a semilogarithmic equation. The mathematico-empirical description of these relationships has been found useful for the characterization of growth behaviour of such microorganisms. KMD

- 2830 ROBACH (MC) and PIERSON (MD). Inhibition of *Clostridium botulinum* types A and B by phenolic antioxidants. *J. Food Prot.* 42(11); 1979; 858-61

- 2831 STOLOFF (L). Aflatoxin control: past and present. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 1067-73

- 2832 LUTHY (J), ZWEIFEL (U) and SCHLATTER (CH). Metabolism and tissue distribution of (^{14}C) aflatoxin B_1 in pigs. *Food Cosmet. Toxicol.* 18(3); 1980; 253-6

Excretion of radioactive aflatoxin B₁ and its metabolites over a 9-day period following the oral administration of ring labelled (14C) aflatoxin B₁ was investigated in two pigs. The faeces constituted the major route of excretion accounting for 51.3% and 64.9% of the administered 14C activity. Tissue analyses showed that the highest 14C activities were in the liver, kidney and lung 1 and 2 days after dosage. More than 90% of the radioactivity in the liver tissue was neither dialysable nor extractable with methylene chloride. KMD

- 2833 JAGGI (W), LUTZ (WK), LUTHY (J), ZWEIFEL (U) and SCHLATTER (CH). *In vivo* covalent binding of aflatoxin metabolites isolated from animal tissue to rat-liver DNA. *Food Cosmet. Toxicol.* 18(3); 1980; 257-60

The results with aflatoxin residues isolated from rat liver reveal that neither macromolecule bound metabolites nor low molecular conjugates exhibit any DNA binding ability. Macromolecule bound AFB₁ derivatives are at least 4000 times less active than AFB₁ with respect to covalent binding to rat liver DNA. It is concluded that the carcinogenic risk for humans who consume liver or meat containing such aflatoxin residues is negligible when compared with the risk from intake of aflatoxins in other food items. KMD

- 2834 PHILLIPS (TD), SIRAJ (MY) and HAYES (AW). Effects of mycotoxins on mixed function oxidase and adenosine triphosphatase systems in neonatal rats. I. Aflatoxin B₁/Rubratoxin B. *Food Cosmet. Toxicol.* 18(3); 1980; 261-6

- 2835 FRIESEN (MD), WALKER (EA) and CASTEGNARO (M). International mycotoxin check sample program. Part I. Report on the performance of participating laboratories. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 1057-66

- 2836 PARK (Y) and MIKOLAJCIK (EM). Effect of temperature on growth and alpha toxin production by *Clostridium perfringens*. *J. Food Prot.* 42(11); 1979; 848-51

- 2837 RAJKOVIC (N) and TADIC (D). Influence of glucono-delta-lactone on multiplication of enterotoxigenic staphylococci. *Technol. Mesa.* 21(3); 1980; 79-80

- 2838 KAUFFMAN (PE). Enzyme immunoassay for *Staphylococcal* enterotoxin A. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 1138-43

- 2839 RITTER (J), O'LEARY (J) and LANGLOIS (BE). Fate of selected pathogens inoculated into foods prepared in slow cookers. *J. Food Prot.* 42(11); 1979; 872-6

None of the foods cooked in either of two slow cookers contained detectable levels of *S. aureus* or *Salmonellae*. Only spores were present in the cooked foods. Results suggest that when the recommended quantities of ingredients are used, and the proper cooking procedure followed, foods prepared in the slow cookers do not present a health hazard. KMD

- 2840 AL-HINDAWI (N) and RISHED (R). Presence and distribution of *Salmonella* species in some local foods from Baghdad City, Iraq. *J. Food Prot.* 42(11); 1979; 877-80

- 2841 KOSTENBADER (KD) Jr. and CLIVER (DO). Purchased cell cultures for detecting foodborne viruses. *J. Food Prot.* 42(11); 1979; 888-9

- 2842 GOO (RKS), KANAI (H), INOUE (V) and WAKATSUKI (H). Spectrophotometric determination of urea in urine stains on foods and containers. *J. Assoc. Off. Anal. Chem.* 63(5); 1980; 985-7
- 2843 DILL (M). Some practical ways of improving factory hygiene. *Confect. Prod.* 46(7); 1980; 321-2
- 2844 SCHIFFNER (E), PREUSS (B) and SONNEFELD (P). Analysis of the food hygienic safety of starter cultures from Zerkst. *Fleisch.* 33(3); 1979; 55-7
The intermediate moisture dried culture has practically the same food hygienic safety as the traditional dry cultures. The liquid culture is in a position to destroy foreign germs, that have penetrated upto a certain depth. This additional safety factor, compared to dry cultures, is relative and is dependent on the reinfection bacterial count. The hygienic and technological specifications issued for the use of starter cultures are to be adhered to for the dressed liquid culture. KMD
- 2845 BANNERT (N) and KODITZ (H). Gastroenteritis in infancy and childhood. *Ernährungsforchung.* 24(4); 1979; 111-3 (German)

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